

Biological Incident Operations: A Guide for Law Enforcement



Cleared for public release, distribution is unlimited.

September 2004



**Homeland Defense Business Unit
Edgewood Chemical Biological Center
U.S. Army Research, Development and Engineering Command**

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE SEP 2004		2. REPORT TYPE		3. DATES COVERED 00-09-2004 to 00-09-2004	
4. TITLE AND SUBTITLE Biological Incident Operations: A Guide for Law Enforcement				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Research, Development and Engineering Command,Edgewood Chemical Biological Center,5183 Black Hawk Road,Aberdeen Proving Ground,MD,21010-5424				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT see report					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 83	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Disclaimers

The opinions or recommendations expressed in this document are a consensus of the authors and do not necessarily reflect the official position of the U.S. Department of Defense.

Any mention of commercial products is for information purposes only; it does not imply recommendation or endorsement by the U.S. Department of Defense or the U.S. Army Edgewood Chemical Biological Center (ECBC).

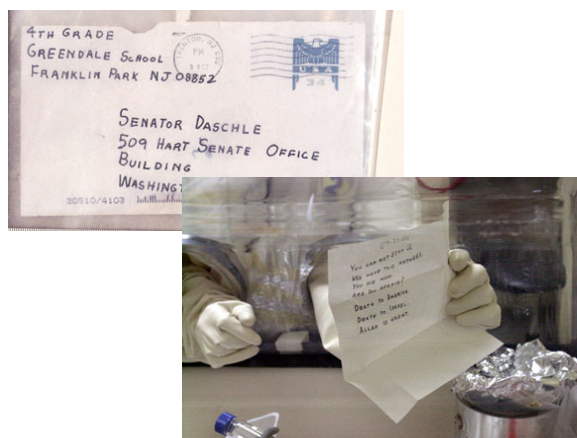
This material may be copied and distributed freely by any emergency response organization. Proper acknowledgement of the ECBC Homeland Defense Business Unit shall be included in any reproduction and redistribution of these materials.

Executive Summary

Biological terrorism continues to pose a significant threat to the public sector, including the potential for massive loss of life. Given September 11, 2001, the anthrax incidents and the current 'War on Terrorism,' it is imperative that emergency responders plan to respond to a biological terrorism incident. The time-critical nature of a biological incident requires that local and national law enforcement agencies develop plans to address the specific needs of an affected community in order to be effective.

The U.S. Army Edgewood Chemical Biological Center (ECBC), formerly the U.S. Army Soldier and Biological Chemical Command (SBCCOM), Homeland Defense Business Unit operates programs designed to improve the ability of U.S. communities and military installations to respond to terrorism incidents involving the use of weapons of mass destruction (WMD). These programs started with the Domestic Preparedness Improved Response Program (IRP), which addressed response issues relating to the civilian emergency response community, and continues through the Military Improved Response Program (MIRP), which focuses on military installation emergency response considerations.

To help law enforcement agencies better understand the response needs and causative factors associated with an act of biological terrorism, the IRP and then the MIRP have developed a foundational biological incident guide for law enforcement. This guide is derived from information gained predominantly from workshops, exercises, after-action reports, and research performed by the programs. The information provided serves as a foundation for any law enforcement agency that is developing plans for a response to a biological weapons incident. Therefore, this guide is applicable as a reference tool for both military and civilian law enforcement departments.



This guide provides an overview of the problems faced by law enforcement that are associated with a biological terrorism incident and specific recommendations for recognizing, preventing, and managing these problems. The guide begins with a brief overview of key aspects of biological terrorism that must be considered throughout planning, training, and response. The guide goes on to address such issues as Incident Awareness, Information/Intelligence, Personal Protection, Incident Response, Incident Investigation, Tactical Operations, Incident Control, and the Mobilization of Assets.

Various agencies are currently reviewing and/or developing plans for WMD response operations. With this in mind, this guide does not claim to be totally definitive or exhaustive in all aspects of the subject. Rather, it is intended to provide one basic document for pre-planning purposes, particularly for those agencies without definitive protocols. The guide is written to promote interagency cooperation and to assist planners, administrators, investigators, responders, and emergency management personnel to better prepare for and execute law enforcement activities related to a biological incident. The content of this document will be of particular interest to anyone involved in preparedness for terrorism.

Edgewood Chemical/Biological Center
U.S. Army Research, Development and Engineering Command
Attn: Mr. Pete Farlow
5183 Blackhawk Road
Aberdeen Proving Ground, Maryland 21010

World Wide Web
<http://www.ecbc.army.mil/hld>

Acknowledgements

The U.S. Army Edgewood Chemical Biological Center wishes to acknowledge the following persons who have generously lent their time and considerable expertise to the development of this law enforcement planning guide.

LAW ENFORCEMENT TECHNICAL WORKING GROUP INITIAL GUIDE DEVELOPMENT TEAM

SALVATORE BIANCA, Baltimore City Crime Laboratory, Baltimore, Maryland

MATTHEW BLAIS, National Terrorism Preparedness Institute, St. Petersburg, Florida

ROBERT GIANNELLI, New York City Police Department, New York City, New York

JOHN HASENEI, Maryland State Police, Pikesville, Maryland

KATHLEEN KUKER, Federal Bureau of Investigation, Washington, D.C.

CHRISTINE REESE, District of Columbia Metropolitan Police Department, Washington, D.C.

JEANINE SANTA, National Domestic Preparedness Office, Federal Bureau of Investigation, Washington, D.C.

SCOTT STINER, Pinellas County Sheriff's Office, Pinellas County, Florida

IAN VABNICK, Federal Bureau of Investigation, New York City, New York

MARK VANBAALEN, Department of State Police, Office of the Fire Marshall, Baltimore, Maryland

MICHAEL WASER, Emergency Services Unit, New York City Police Department, New York City, New York

CRAIG WATZ, Federal Bureau of Investigation, Washington, D.C.

FINAL REVIEW PANEL

ROBERT GIANNELLI, New York City Police Department, New York City, New York

CHRISTINE REESE, District of Columbia Metropolitan Police Department, Washington, D.C.

SCOTT STINER, Pinellas County Sheriff's Office, Pinellas County, Florida

IAN VABNICK, Federal Bureau of Investigation, New York City, New York

HOMELAND DEFENSE BUSINESS UNIT IRP STAFF

GREGORY MROZINSKI, Team Leader, ECBC, Improved Response Program, Aberdeen Proving Ground, Maryland

PETE FARLOW, Team Leader, ECBC, Improved Response Program, Law Enforcement Functional Group, Aberdeen Proving Ground, Maryland

CHUCK CRAWFORD, ECBC, Improved Response Program, Aberdeen Proving Ground, Maryland

JOHN SIEGMUND, Program Leader, Titan Corporation, Edgewood, Maryland

DAVID DICKSON, Deputy Program Manager, Titan Corporation, Edgewood, Maryland

MARCI CATLETT, Research Analyst, Titan Corporation, Edgewood, Maryland

LYNN STADTERMAN, Editor, Titan Corporation, Edgewood, Maryland

Preface

This guide is based on the findings of a multi-agency working group, comprised of 12 representatives from the staff of major academic centers and research, government, military, law enforcement, and emergency management institutions and agencies. The process used in development and validation of the guide has involved extensive literature research, a series of working group sessions, and expert peer review.

The authors have made every effort to ensure accuracy of the information contained in this report, however they cannot be responsible for any errors found herein. The opinions and/or recommendations expressed in this document are an informal consensus of the working group participants and do not necessarily reflect the official position of the U.S. Department of Defense.

This document has been approved for public release. The document may be freely reviewed, abstracted, reproduced and translated, in part or in whole, but is not for sale nor is for use in conjunction with commercial purposes. U.S. Government agencies (Federal, State, and local) may request an official copy of this report from Mr. Pete Farlow, ECBC, at (410) 436-5781. Contractors may request a copy of this report through their sponsoring government agency.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Table of Contents

Executive Summary	iii
Acknowledgements	v
Preface.....	vii
Table of Contents	ix
1. Introduction.....	1
1.1 Improved Response Programs	
1.2 Law Enforcement Technical Working Group (LETWG)	
1.3 LETWG Approach	
1.4 Assumptions	
1.5 Organization	
2. Biological Incident Overview	5
2.1 Agent Characteristics	
2.2 Types of Agents	
2.3 Methods of Dissemination	
2.4 Likely Culprits	
2.5 Possible Targets	
2.6 Types of Incidents	
2.7 Recent BW Incidents	
3. Biological Terrorism Awareness	14
3.1 Indicators of Biological Terrorism Activity	
3.2 Indicators of a Biological Incident	
4. Biological Incident Information/Intelligence.....	16
4.1 Sources of Information	
4.2 Gathering Intelligence	
4.3 Biological Incident Threat Assessment	
5. Personal Protection Measures	22
5.1 Medical Prophylaxis	
5.2 Isolation Precautions	
5.3 Personal Protective Equipment	
5.4 Decontamination	
5.5 Training	

Table of Contents

(continued)

6. Proposed Response to a Credible Threat.....	27
6.1 Role of Law Enforcement	
6.2 Initial Actions	
7. Proposed Response to a Suspect Material/Package/Device	29
7.1 Role of Law Enforcement	
7.2 Initial Assessment	
7.3 Initial Actions	
8. Incident Investigation	34
8.1 Evidence Collection	
8.2 Laboratory Support	
8.3 Witness Interviews	
9. Tactical Entry of a Suspected Biological Production/Storage Site.....	38
9.1 Task Force Approach	
9.2 Operational Considerations	
9.3 Decontamination Support	
9.4 Medical Support	
9.5 Perimeter Security	
9.6 Training	
9.7 Rehearsals	
10. Incident Control	42
10.1 Public Notification/Information	
10.2 Physical Control Measures	
10.3 Control of Response Assets	
11. Community Outreach.....	47
11.1 Concept Overview	
11.2 Role of Law Enforcement	
11.3 Resources	
11.4 Techniques	
11.5 Personal Protective Equipment	
12. Mobilization of LE Assets	50
12.1 Concept Overview	
12.2 Event Levels	
12.3 Response Zones	

Table of Contents (continued)

13. Summary.....	52
-------------------------	-----------

14. References.....	53
----------------------------	-----------

Appendices:

A CDC List of Threat Agents	A-1
B Biological Agent Data Summaries.....	B-1
C Performance Objectives Matrix	C-1

List of Figures

Figure 1	Estimated Cost of Operations Against a Civilian Population Per km ²	5
Figure 2	Relationships of Air Contaminant Sizes	9
Figure 3	Distribution of Motivation for Biological Terrorism Incidents	10

List of Tables

Table 1	Biological Quick Reference Chart	B-8
----------------	--	-----

Introduction

1

The purpose of this guide is to introduce and then discuss recommended techniques and strategies to assist law enforcement organizations with preparing for and responding to an incident of biological terrorism. This document was written to provide a basis for standard operating procedure (SOP) planning, and to assist commanders, coordinators, and responders at all levels to better manage the consequences of a biological terrorism incident.

Although this planning guide is instructive in addressing issues surrounding the management of a biological incident, the authors recognize that local logistical and legal conditions may dictate the use of alternative procedures. Further, it is not our intent to say that biological incident response strategies and procedures that differ from the practices in this guide will necessarily invalidate or detract from an effective response.

Additional program
chemical/biological response
guides and reports are
available on the ECBC Web
site at:
<http://www.ecbc.army.mil/hld>

The authors encourage law enforcement planners and responders to develop and continually update their knowledge, skills, and abilities with respect to biological-incident preparedness and response through training. In fact, we believe that successful implementation of this guide can be realized only if responders possess basic (and in some cases advanced) training in the fundamentals of weapons of mass destruction (WMD) incident operations.

The authors acknowledge that most law enforcement agencies will be faced with the dilemma of responding to an incident beyond that which their resources allow. It remains however, one of the primary responsibilities of law enforcement to assess the situation at hand and, after judging the seriousness of the incident and availability of resources, to advise on the appropriate level of response required. Because of the potentially devastating consequences of biological terrorism, pre-incident planning, early recognition and a rapidly integrated mutual aid network are critical.

The authors also recognize that the size of the community, availability of resources, and the level of expertise vary greatly from jurisdiction to jurisdiction. Therefore, the experts who have proposed this guide strongly suggest that agencies unable to perform some or all of the tasks referenced herein seek assistance from other agencies in order to properly plan for and respond to a biological terrorist incident. Assistance may take the form of securing additional training, pooling resources, forming partnerships with neighboring jurisdictions, and/or seeking additional funding through a variety of resources available through various appropriation bills and Federal grants. Many organizations around the country already have programs in WMD preparedness. Much of the information in this guide is derived from such sources, including many of the references listed in the back of this document.

Based on this guide, agencies may determine that improvements are needed in their training and policies concerning biological incident operations. This guide may be a justification for strengthening an agency's/community's resources.

1.1. Improved Response Programs

The Domestic Preparedness Improved Response Program (IRP) was created in response to the National Defense Authorization Act of 1996, otherwise known as the Nunn-Lugar-Domenici Act.¹ The IRP supported research, evaluation and demonstration programs, technical development, and information dissemination for emergency responder chemical/biological (C/B) incident response guidance and planning. In October 2000 the IRP transitioned from the Department of Defense (DoD) to the Department of Justice. DoD then formed the Military Improved Response Program (MIRP) to address similar response considerations that are unique to military units and installations. Specific activities of the two programs are:

- Sponsoring special projects and research and development programs that are focused on improving and strengthening the national domestic preparedness to C/B terrorism
- Conducting national demonstration projects that employ innovative or promising approaches for improving preparedness to C/B terrorism
- Developing new strategies, techniques, and technologies to improve C/B weapons defense and incident response operations
- Recommending actions that can be taken by Federal, State, and local governments as well as private organizations to improve domestic preparedness to C/B terrorism
- Developing new methods of C/B weapons defense and reduction of national vulnerability

Program objectives are guided by the priorities and the needs of the emergency response communities. To ensure utility, the programs actively solicit the views of emergency response professionals, health care providers, and researchers in the continuing pursuit of answers that inform policymakers.

1.2. Law Enforcement Technical Working Group (LETWG)

The IRP established a LETWG to address the needs of the law enforcement community. The working group was charged with studying the role of law enforcement as they relate to biological incident response operations. Part of this effort involved identifying consensus-based guidelines to improve the overall effectiveness of such a response. The IRP team leader solicited participation from Federal, State, and local law enforcement agencies and institutions. Candidates from these organizations were identified based on their specific knowledge and expertise in various law enforcement functions. Of the candidates, 12 individuals were invited to serve as members of the LETWG.

¹ National Defense Authorization Act of FY 97

1.3. LETWG Approach

In the development of this guide, the LETWG focused on the law enforcement activities that were developed as part of the Biological Weapons IRP program. The BWIRP conducted a series of multi-agency workshops that focused on identifying improved approaches to managing the consequences of biological terrorism. One product of this effort is a template for providing an integrated response following a biological attack against a civilian population. The *Integrated Response Template* was designed to provide the framework for a systematic, coordinated, and effective response to the affected community of a large-scale incident. The template organizes critical response activities and serves as an outline by which local emergency service communities can design their own plans. The information provided in this guide expands on the law enforcement activities identified in the IRP's *Integrated Response Template*.²

The authors of these guidelines have made considerable effort to integrate proven effective concepts to maximize application while minimizing the training required for implementation.

1.4. Assumptions

In developing these guidelines, the LETWG applied the following assumptions:

- A biological incident can range from a threat against a single individual to an incident involving hundreds of thousands of casualties and/or fatalities.
- During a biological incident, the actual infected casualties and psychosomatic victims or “worried well” will likely overwhelm the emergency medical system and hospitals.
- Communities will activate emergency plans to care for victims, manage traffic flow, and mitigate mass panic and civil unrest.
- During a response to biological terrorism, it may be necessary to supplement local law enforcement personnel with officers from other jurisdictions, State, and Federal agencies to conduct investigations, and provide security and traffic control.
- A simple system will be needed that rapidly integrates law enforcement and public health resources to facilitate incident investigation and victim management.
- Specialized tactical police units will be required to operate in a potentially contaminated environment.

1.5. Organization

No two incidents are alike, and each will require resources, tactics, and strategies tailored to its particular characteristics, however, some fundamental considerations and response activities are commonly applicable when planning for such an event. The information contained in this guide

² U.S. Army SBCCOM Biological Warfare Improved Response Program, 1998 Summary Report

provides an overview of the problems associated with a biological incident and specific recommendations for recognizing, preventing, and managing these problems.

At the end of this document is a list of references used in researching this report and several appendices containing related information.

Biological Incident Overview

2

Biological terrorism is the intentional or threatened use of viruses, bacteria, fungi, or toxins from living organisms to produce death or disease in humans, animals, or plants.³ Biological agents are microorganisms (or a toxin derived from it) which cause disease in man, animals, or plants or which cause the deterioration of material.⁴ Biological weapons have the unique ability to inflict large numbers of casualties over a wide area with minimal logistical requirements, and thus they are classified as weapons of mass destruction (WMD).

Among the different classes of WMDs, several inherent factors make biological weapons an ideal choice for carrying out acts of terrorism.⁵ Such factors include:

- The relative ease and low cost of producing the agents
- The use of biological weapons are difficult to detect when covertly disseminated
- The effects are generally delayed
- The potential to selectively target human, animals, or plants

Unfortunately, all of these factors conspire to make civilian communities highly vulnerable to today's ambitious terrorist. Experts emphasize that we should continue to vigilantly plan before another major incident occurs, as most or all information needed to develop biological weapons is available in open scientific literature, via the Internet, public libraries, and other sources. Biological weapons also pose a financial advantage, as was clearly illustrated by a 1969 panel of experts, which estimated the cost of operations against civilian populations at \$1/km² for biological weapons, versus \$600/km² for chemical, \$800/km² for nuclear, and \$2000/km² for conventional weapons.⁶

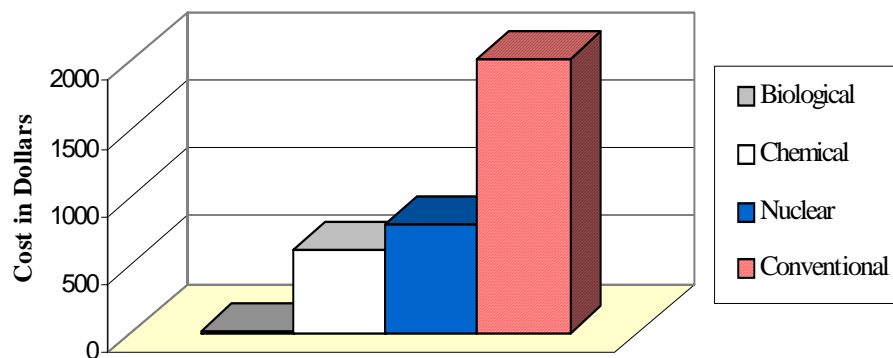


Figure 1. Estimated Cost of Operations Against a Civilian Population per km².

Many of the processes for creating biological weapons are also fairly forgiving in terms of levels of purity and quality control required to produce weaponizable agents. Although “low-tech”

³ Centers for Disease Control and Prevention, *Bioterrorism: An Overview Bioterrorism: Bioterrorism Preparedness and Response Program*

⁴ NATO Handbook on the Medical Aspects of NBC Defensive Operations. A-Med-P6 Part II Biological

⁵ Office of Emergency Preparedness, *Proceedings of the Seminar on Responding to the Consequences of Chemical and Biological Terrorism*

⁶ Defense Protective Services, *10-90 Gold NBC Response Plan*

approaches or less-than-optimal production procedures may take somewhat longer or may endanger the health of production personnel, they are nonetheless fully capable of making significant quantities of agent in a short time span.

One of the greatest advantages in choosing biological weapons is that it is extremely difficult to defend against them since a cloud of biological agent is colorless, odorless, and silent. Currently, biological detection technology is limited, thus without prior intelligence, it is probable that a biological attack could be carried out well before anyone is aware that it has taken place. Compounding the problem, many health and medical providers are not aware of the early signs associated with such an attack since many of the early symptoms of a biological agent exposure are similar to flu-like symptoms. As a result, considerable time may elapse before the extent of the exposure is appreciated, and appropriate protection and treatment measures are implemented.

2.1. Agent Characteristics

Although there are many types of disease-causing biological agents, only a relatively small number have characteristics suitable for a biological attack. Meaning, not all disease-causing agents can be successfully used as a biological weapon. Intrinsic features of biological agents influence their potential for use as a weapon, such as:⁴

- **Infectivity:** The infectivity of an agent reflects the relative ease with which microorganisms establish themselves in a host species. Pathogens with high infectivity cause disease with relatively few organisms, while those with low infectivity require a larger number. High infectivity does not necessarily mean that the symptoms and signs of disease appear more quickly, or that the illness is more severe.
- **Virulence:** The virulence of an agent reflects the relative severity of disease produced by that agent. Different microorganisms and different strains of the same microorganism may cause disease of different severity.
- **Toxicity:** The toxicity of an agent reflects the relative severity of illness or incapacitation produced by a toxin.
- **Pathogenicity:** Pathogenicity reflects the capability of an infectious agent to cause disease in a susceptible host.
- **Incubation period:** A sufficient number of microorganisms or quantity of toxin must penetrate the body to initiate infection (the infective dose), or intoxication (the intoxicating dose). Infectious agents must then multiply (replicate) to produce disease. The time between exposure and the appearance of symptoms is known as the incubation period. This is governed by many variables including: the initial dose; virulence; route of entry; rate of replication; and host immunological factors.
- **Transmissibility:** Some biological agents can be transmitted from person to person directly. Indirect transmission (for example, via arthropod vectors) may be a significant means of spread as well. In the context of BW casualty management, the relative ease with which an agent is passed from person to person (that is, its transmissibility) constitutes the principle concern.
- **Lethality:** Lethality reflects the relative ease with which an agent causes death in susceptible population.

- **Stability:** The stability of an agent is affected by various environmental factors, including temperature, relative humidity, atmospheric pollution, and sunlight.

Unique to many of these agents, and distinctive from their chemical counterparts, is the ability to multiply in the body over time and actually increase their effect following the initial dissemination. With certain agents, only a few particles would be needed to cause infection that could potentially lead to an epidemic. Victims of a biological attack generally do not display any immediate signs or symptoms. The effects of these agents are not immediate, as most biological agents need time to grow and replicate in the body to cause disease. This factor is beneficial to the terrorist, as it allows them more time to escape apprehension.

2.2. Types of Agents

The classification of biological agents is important to investigators and care providers in terms of detection, identification, prophylaxis (pre-symptom medication), and treatment. The Centers for Disease Control and Prevention (CDC) has prepared a list of agents that pose the highest threat to a civilian population (see Appendix A - CDC List of Threat Agents). Additional biological agent information is provided in Appendix B (Biological Agent Data Summaries).

Biological agents that may be used in terrorist attacks, are generally classified as:⁵

- 2.2.1 Bacteria** are single cell, free-living organisms. Bacteria can vary in size and shape and some have the capability of forming spores. Spores are much harder since they are more capable of surviving in environments, (e.g. ultraviolet light, heat, etc.) which would destroy other bacteria. The diseases that bacteria produce can often be treated with specific antibiotic therapy. Bacteria are the causative agent of anthrax, brucellosis, tularemia, plague, and numerous other diseases.
- 2.2.2 Viruses** are organisms that require living cells in which to grow and replicate, therefore, they are dependent on a living host to cause their effects. Viruses are the simplest type of microorganism, about 100 times smaller than bacteria. Viruses are the causative agent of Smallpox, Influenza, Venezuelan Equine Encephalitis, and hemorrhagic fevers. The diseases that viruses produce generally do not respond to antibiotic therapy but may be treatable by antiviral compounds or by immune serum globulins.
- 2.2.3 Toxins** are poisonous substances produced and derived from living plants, animals, or microorganisms; some toxins may also be synthetically manufactured. Toxins are not living organisms; they are nature's version of chemical agents. Unlike manmade chemical agents, toxins are not volatile and they do not tend to cause a persistent environmental hazard. Significant toxins are Botulinum Toxin, Staphylococcus Enterotoxin Type B (SEB), and Ricin. Toxin effects typically develop faster than other forms of biological agents and must be countered by specific antitoxins or select pharmacological agents.

2.3. Methods of Dissemination

When an agent is not contagious, as with most biological agents, it is necessary to have a dissemination mechanism that spreads the agent to the intended target, to cause disease or incapacitation. Large-scale dissemination of biological agents requires some sophistication to be effective; however, anything from a piece of fruit to a ballistic missile can be used to disseminate a biological agent. Following the initial release of an agent, the same routes of entry pertinent to natural spread of diseases are also relevant to an exposed population (that is, through inhalation, ingestion, or broken skin surfaces). Experts believe that the most devastating method of dissemination is delivering agents by generating an aerosol, infecting people as they breathe. Other routes of entry are thought to be less critical than inhalation but they are nonetheless potentially significant.^{7,8} An example of unintentional dissemination of a biological agent occurred in the anthrax mailings (October 2001) when anthrax spores cross-contaminated machinery, postal bags, and other letters as the mail traveled through the postal system. Once a biological agent is disseminated it can be introduced into the human body through the following four methods.

2.3.1 Airborne Inhalation. The natural motion of breathing provides with each breath a continuous, immediate and direct path of entry for infectious organisms or particles into the body via the lungs and subsequently the circulatory system. Infectious organisms ranging from 1 to 5 microns in size, when inhaled, can penetrate the body's natural air filtering processes and have the best chance to cause infection. Figure 2 provides a comparison of the sizes of different air contaminants and which ones are visible to the naked eye, through an optical microscope, or scanning electron microscope (SEM). Many biological organisms that are used as warfare agents are naturally occurring in nature. These organisms normally infect humans through natural means, i.e. ingestion, inhalation, or via a vector, e.g. an insect bite. In the normal means of infection these organisms have a well-documented disease progression (clinical symptoms). When these organisms are weaponized and artificially introduced to humans (i.e. a terrorist attack) then the normal, well-documented signs and symptoms may not manifest in the same manner as a natural infestation.

Aerosol delivery systems aim to generate invisible clouds of particles or droplets that can remain suspended in air for long periods. Aerosol dissemination is accomplished by one of two basic methods: point- or line-source dissemination. Point-source dissemination refers to a stationary release. Line-source dissemination involves spraying an agent from a moving aerosol generator. In either case, the resulting cloud can be transported by the wind over long distances. Agricultural insecticide spray systems are extremely effective for generating a biological cloud with ideal characteristics. A less efficient method of aerosol dissemination can be accomplished using explosives; however, such devices generally destroy a large percentage of the agent through heat and shock.

⁷ T.Dashiell, W. Patrick, F. Sidell, *Chem-Bio Handbook*

⁸ U.S. Army MRIID, *Medical Management of Biological Casualties Handbook*

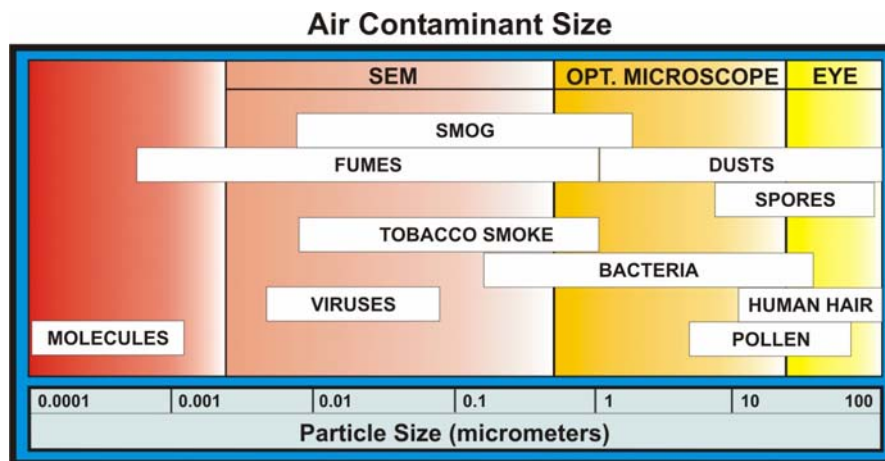


Figure 2. Relationships of Air Contaminant Sizes⁹

2.3.2 Ingestion. To date, the largest and most effective terrorism attacks using biological agents have involved the contamination of food.¹⁰ Direct contamination of food and water or product tampering can be used as a means to disseminate biological agents. In general, only uncooked food is vulnerable, because the heat generated during cooking readily destroys most biological agents. This method of attack is most suitable for limited targets or assassination. Dilution, filtration, and chlorination processes associated with a community's water system significantly prevent the likeliness of a successful attack in the public water system. Contamination of an individual water supply, such as water just before it enters a specific building, is a more feasible scenario. It is also possible that food or other ingested products can become indirectly contaminated as a result of an aerosol attack.

2.3.3 Skin Contact-Exposure. An important difference between biological agents and chemical agents is that unlike chemical agents, aerosolized biological agents generally do not penetrate the skin and thus do not represent a significant contact hazard. Mucous membranes and damaged skin, such as an open cut or abrasion, however, constitute potential breaches through which biological agents may pass. Personal hygiene, such as, washing with soap and water and proper waste disposal measures significantly reduces the potential of infection by this route.

2.3.4 Vector Transmission. Many diseases are naturally transmitted to humans by insects, thus it is possible to spread some biological warfare agents by releasing infected natural (or unnatural) insects such as mosquitoes, ticks, or fleas. These live vectors can be produced in large number and infected by allowing them to feed on infected animals, blood, or artificially produced sources of agent. Experts believe that this method of dissemination is less likely to be used because the process is complex, difficult to control, and relatively unreliable for attacks against specific targets.

⁹ DHHS (NIOSH), Publication 2003-136, *Guidance for Filtration and Air-Cleaning Systems to Protect Building Environments from Airborne Chemical, Biological, or Radiological Attacks*

¹⁰ Carus, S., *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the 20th Century*

2.4. Likely Culprits

As the military and economic gaps between nations grow and as some disadvantaged nations seek a balance of power, there may be a tendency by these nations to overcome their disadvantage by choosing terrorism and the use of weapons of mass destruction. This threat, however, is by no means limited to state-sponsored terrorists. The potential for non-state-sponsored biological terrorism was demonstrated after the 1995 attack on the Tokyo subway, when members of the Japanese religious cult Aum Shinrikyo were found to have experimented with biological warfare agents.

Likely practitioners of biological terrorism may include foreign state-sponsored terrorist groups, domestic extremist groups, and independent terrorists. History has shown that in most instances, terrorists planning mass murder do not attempt indiscriminant acts. They do not seek the random removal of people, but rather, the elimination of particular people or groups. However, this pattern did not hold true in the “Attacks on America” of September 11, 2001. Motivations for carrying out acts of biological terrorism include political views, moral beliefs, racial prejudice, and religion.⁵ A report published by the Monterey Institute of International Studies describes the results of a comprehensive review of 33 alleged incidents involving biological agents from 1960 to January 1999.¹¹ The review uncovered a number of reasons that have led terrorists and criminals to become interested in using biological weapons. The distribution of the motives is illustrated below.

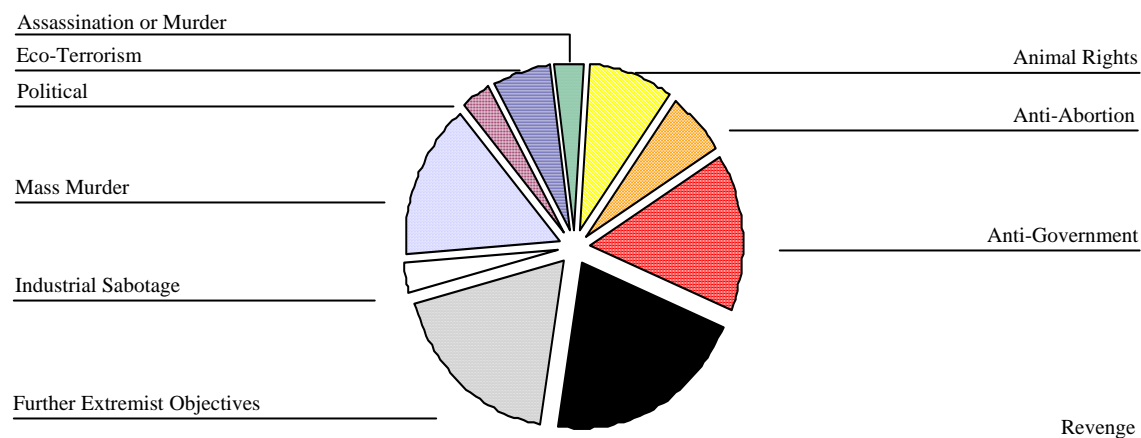


Figure 3. Distribution of Motivations for Biological Terrorism Incidents, 1960—Jan. 31, 1999 (33 cases)

Experience tells us that there are signs that law enforcement can watch for in individuals or groups considering acts of terrorism.¹² These signs include:

- Disgruntled individuals that might routinely have access to medical or research laboratory facilities
- Notions or beliefs of racial supremacy, ethnic hatred, or religious fanaticism

¹¹ Tucker, Jonathan B., *Historical Trends Related to Bioterrorism: An Empirical Analysis*

¹² National Terrorism Preparedness Institute, *Evidence, Detection, and Preservation for Weapons of Mass Destruction*

- A deep-rooted hostility toward a specific ethnic group or government
- Isolation psychology, social and geographic, as manifested in structures like compounds and mountain redoubts (although such isolation is also possible in an urban setting)
- Evidence of paranoid or conspiratorial thinking and the belief that the group or individual is under imminent attack
- Apocalyptic or doomsday thinking
- The presence of a charismatic leader who demands and receives absolute obedience

2.5. Possible Targets

Biological agents can be used against a variety of targets, including military and civilian personnel, crops, and livestock. Experts and strategists believe that the targets of the future will be entire communities, industry, and economic systems as opposed to buildings and airplanes. This is not to say that such traditional targets are out of the question. Terrorists tend to choose targets that offer little danger to themselves, with the exception of militant extremists, who are willing to lose their lives in the conduct of a terrorist attack, as evidenced by the pilots of the hijacked planes on 9/11. Some terrorists may also be sent on a mission to release a biological agent without full knowledge of what they are doing. As a result, the terrorist may be among those exposed and dying from the agent. They target areas with relatively easy public access. Sophisticated terrorists look for visible targets where they can avoid detection before and after an attack.⁵ The most probable targets for biological terrorism include mass gatherings, such as:

- Large religious or political events
- Mass transit centers (i.e. subway systems and airports)
- High-profile government facilities or landmarks
- Multinational events or conferences
- Sporting or festive events
- Large metropolitan areas
- High-profile consumer products, “product tampering” i.e. the incident in 1982 when cyanide was placed in Tylenol® bottles.

2.6. Types of Incidents

An attack using biological agents can present in three different ways: a threat, a package or item suspected of containing a biological agent, or a covert release. The challenge is developing plans that can address all three different types of attack.

2.6.1 Credible Threat. The first form of biological terrorism is the delivery of a credible threat. This is perhaps the most likely scenario and due to the catastrophic consequences of a full-scale attack, officials will be forced to make difficult decisions regarding the appropriate level of response. (see Chapter 6 - Response to a Credible Threat)

2.6.2 Suspect Package/Letter. Terrorists may also deliver a package claiming to contain a biological agent, utilize the postal service or other mail delivery services to forward contaminated letters, causing widespread exposure to people, machinery and property. While many of these packages contain only inert material, responders must assume a hazard exists. Therefore, bomb disposal and hazardous material specialists should assess any suspect item to determine the nature and extent of the hazard (see Chapter 7 - Response to a Suspect Package or Letter).

2.6.3 Actual Release. The third type of attack is an actual release of a biological agent. Such an attack will likely be carried out covertly. While technically the most difficult, this is one of the most effective uses of a biological weapon. Disseminating a biological agent without warning reduces the time available to successfully treat victims, thereby increasing the overall impact, while providing the terrorist the best chance to escape.

2.7. Recent BW Incidents

A former U.N. Security Council staff member, Jessica Stern, indicated that incidents of terrorism increased fivefold since the 1970s (even before the attacks of 2001) and the number of people killed per attack had doubled.¹³ The following comprises a list of some of the notable incidents involving the use of biological agents that occurred prior to the anthrax mailing of 2001:⁶

- In 1972, a plot was uncovered involving a fascist group in the U.S. called the “Order of the Rising Sun.” This group was planning to use 30kg to 40kg of typhoid to contaminate the Chicago and St. Louis water supplies.
- In 1984, two followers of the Rajneesh Bagwhan produced and disseminated salmonella bacteria via the salad bars of local restaurants to affect the outcome of a local election. No one was killed, however, 715 persons were sickened by the attack. The FBI investigation resulted in the arrest of a nurse who produced the bacteria and a sect member who disseminated it.
- In 1994, The Aum Shinrikio cult of Japan attempted without success to disperse anthrax from a tower on Tokyo. This act went unnoticed until the investigation of an unrelated incident uncovered documents detailing the attack.
- In 1996, officials at St. Paul Medical Center in Dallas, Texas determined that bacteria from a microbiology laboratory was implanted in doughnuts and muffins and served to workers. Twelve people became ill.
- In 1997, a petri dish found in the mailroom of the B’nai B’rith headquarters was labeled to indicate the presence of *Bacillus anthracis* (anthrax) and *Yersinia pestis* (plague). Washington DC emergency personnel responded to the incident. As a result, a three-block area in downtown Washington DC was cordoned off and personnel who came in contact with the suspect material were decontaminated and sent to the hospital. Analysis of the suspect material showed the substance contained no hazardous material. Other recent biological hoaxes like the B’nai B’rith incident have also disrupted communities across the country.

¹³ Chandler, David & Landrigan, India, *A Journalist Guide to Covering Bioterrorism*

- In 1998, three men were arrested for threatening to kill Federal agents and State officials with biological agents in Olmito, Texas. The men claimed to represent the Republic of Texas, a militant organization that claims sovereignty over Texas.

Following the terrorists' attacks of September 11th on New York and Washington, D.C., a wave of biological attacks involving anthrax release was unleashed during October 2001 in Florida, New York, New Jersey, and Washington, DC. As difficult as it may be to carry out a biological attack may be, the anthrax attacks through the U.S. mail demonstrated that with access to a highly refined agent, a damaging bioterror attack could be delivered with only an envelope and a stamp.¹² Before October 2001, the last case of inhalation anthrax in the United States had occurred in 1976. Identification of inhalation anthrax in a journalist in Florida marked the beginning of the first confirmed outbreak associated with intentional anthrax release in the United States.¹⁴

From October 4 to November 2, 2001, the Centers for Disease Control and Prevention (CDC) and State and local public health authorities reported 10 confirmed cases of inhalation anthrax and 12 confirmed or suspected cases of cutaneous anthrax in persons who worked in the District of Columbia, Florida, New Jersey and New York.¹³ The non-distinctive nature of the initial phase of inhalation anthrax presented a diagnostic challenge. Targets of the first mailings were all media related - Tom Brokaw of NBC News, The New York Post, and American Media (publishers of tabloids). Politicians Senator Tom Daschel (D-South Dakota) and Senator Patrick Leahy (D-Vermont) were the intended targets of the second mailing. Eight of 10 patients were in the initial phase of illness when they first sought care. Of these eight, six received antibiotics with activity against *B. anthracis* on the same day, and all six survived. Four patients, including one with meningitis, were exhibiting sudden/severe onset of signs of illness when they first received antibiotics with activity against *B. anthracis*, and all four died.¹⁴

¹⁴ CDC & et.al, *Bioterrorism-Related Inhalation Anthrax: The First 10 Cases Reported in the United States*

An act of terrorism can happen anywhere, at any time, and when you least expect it. No jurisdiction (urban, suburban, or rural) is totally immune. As first responders, law enforcement personnel must familiarize themselves with the threat and characteristics of biological weapons to better prepare for and protect against their use or mitigate the effects after their use. To stand the best chance of providing a timely and effective response, law enforcement personnel must also be able to recognize the warning signs associated with biological terrorism.

3.1. Indicators of Biological Terrorism Activity

While conducting routine police work, officers should be aware of indicators of possible biological terrorism activity. Pre-incident warning signs include:¹⁵

- Unusual references to the terms, “bacteria, bugs, germs, microbes, microorganism, poison, toxin, venom, or virus.” (Particularly with regard to their use as a weapon)
- Unusual references to the terms, “antidote, biohazard, bacteriological, culture, infectious material, respirators, spores, vaccine, or vector”
- Attempts to purchase or obtain information concerning biological cultures or spores from medical or research suppliers
- Information concerning the theft or attempted theft of biological cultures or spores from university or medical research facilities
- Unusual purchases of laboratory supplies or specialized microbiology or medical equipment (addresses of medical mail order companies)
- Attempts to acquire vaccines or medical antidotes against poisons or disease
- Possession or attempts to acquire specialized protective breathing apparatus or protective suits
- Possession or attempts to acquire security plans or maps of research facilities, including university and private labs
- Possession or attempts to acquire technical information or maps of public water supply lines, storage tanks, or building ventilation systems
- Reports of suspicious medical research activities such as reports of rats, mice, rabbits, sheep, goats, or eggs at an inappropriate location

¹⁵ FBI Bomb Data Center, *Biological Materials and Hazards*

3.2. Indicators of a Biological Incident

The most important factor in saving lives in response to a biological incident may be in the ability of the law enforcement, medical, and public health communities working together to determine that an attack occurred prior to victims presenting symptoms at medical facilities. This is a difficult task since biological agents are odorless and tasteless and generally have no immediate effects.

Communities must instead recognize the telltale signs of a biological terrorism incident, such as:⁴

- Reports of an explosion that causes little damage or devices that disperse a mist or powder with no immediate effects
- Reports or observations of unscheduled spraying (time/location inconsistent with normal pesticide spraying)
- Discovery of abandoned spraying equipment or discarded protective suits, biohazard bags, or laboratory equipment (i.e. incubator, fermenter, or containers with biological labels) are indicators that may identify the use or development of biological agents
- The presence of unusual swarms of biting insects, as they may be used as a mechanism for dissemination
- Observation of unusual numbers sick or dying animals, often of different species. Most biological warfare agents are capable of infecting a wide range of hosts and sometimes animals are more susceptible, therefore some animals may be affected before humans
- Any unexplained outbreak of respiratory or flu-like illness



Information sharing between law enforcement and the public health organizations is absolutely critical to a community's biological terrorism preparedness effort and may be enhanced with liaison officers with formal staff relationships. The success or failure of a timely response will depend upon the speed and accuracy of the diagnostic efforts, together, with the transmittal of timely information from organizations involved in public health surveillance and criminal investigation. Communities should develop formal interagency partnerships to identify information/intelligence requirements and open lines of communication, ensuring information is accessible and appropriately monitored. Communities should also implement mechanisms to facilitate rapid alert notifications and sharing of public health information with necessary law enforcement organizations. In some cases law enforcement organizations might even consider incorporating public health surveillance information into their routine intelligence reporting activities.²

4.1. Sources of Information

Most communities have mechanisms already in place that can be useful sources of incident-related information. By implementing an integrated monitoring and reporting system, these sources may provide an early recognition of a biological incident. Once a public health event has been detected, such a system can continue to gather and assess information in support of the incident investigation effort. Important sources of incident information include:

4.1.1 Public Health Officials. The first indication of a biological incident will probably be the presence of acutely ill patients with an unexplained illness. Unfortunately, it is possible that such an occurrence will initially be mistaken for a bad flu season. In an attempt to identify the source and cause of unusual illness, public health officials will investigate such factors as disease pattern. In a suspected biological incident, these efforts can result in a great deal of information that is useful to criminal investigators. Public health information can be used to focus and prioritize law enforcement investigation activities.

Community public health officials routinely investigate and analyze disease patterns. The resulting disease pattern following a biological terrorism attack is likely to have characteristics that differ from those of a naturally occurring outbreak. In contrast to natural outbreaks that increase over a period of weeks or months, a biological incident may produce a large number of sick in hours to days (usually 48-72 hours). Additional indicators of an unnatural health event include:

- If the distribution of sick individuals is aligned with the prevailing wind direction
- If there is an unusually high prevalence of respiratory symptoms in diseases that are typically not acquired through inhalation
- If the rate of severely ill is extremely high among sick individuals

- If the agent identified is not conducive with the natural parameters associated with the disease

- 4.1.2 Clinical Diagnostic Laboratories.** General policies already exist for identification and reporting suspected cases of rare infectious disease illness. Medical laboratories are required to notify public health agencies when any patient is diagnosed with a disease caused by any of the threat agents. Medical laboratories can provide advanced notification by monitoring the volume of tests ordered, or by reporting any occurrences where a patient is diagnosed with disease caused by a potential terrorist agent. Laboratories may be more likely to identify unusually high occurrences of a particular syndrome, because they receive specimens from multiple medical providers. Many public health agencies already monitor for rapid increases in lab test ordering above seasonally expected levels.
- 4.1.3 911 Call Center** can provide information on the volume of calls and types of EMS responses. Any increase in the volume of calls above seasonally expected levels with no obvious explanation could signify the occurrence of a public health event. The nature of the 911 calls can be analyzed for patterns. Mapping the geographic distribution of calls may point to the possible source of agent release.
- 4.1.4 Medical Examiner** reviews death certificates and may investigate unexplained deaths. The medical examiner can provide information on reported deaths and those caused by a potential biological agent exposure or any suspicious deaths in previously healthy individuals. Any rapid rise above seasonally expected levels with no obvious explanation might be an indication of an unnatural public health event.
- 4.1.5 Hospital Emergency Departments** are effective sites for incident information because high volumes of patients are seen 24 hours a day, and emergency departments are frequently the primary sites of health care delivery for a large part of the population. Hospital administrators or infection control staff can provide information on changes in hospital admissions and emergency department visits that suggest suspicious circumstance.
- 4.1.6 Animal Control/Veterinary Clinics/Zoos** are more familiar with and more likely to recognize zoonotic diseases. Since many biological agents are natural sources of disease in animals, non-human species may be the first victims of a biological terrorism attack. Animal care and animal control professionals can provide information regarding recent disease outbreaks among animals.
- 4.1.7 Pharmaceutical Distributors** servicing a particular community may recognize an unseasonably rapid increase in the number of over-the-counter and prescription medication sales, which might be the first indications of an incident in progress. Anti-diarrheal sales can reflect food-borne or water-borne illness, while flu medication can reflect illness with flu-like symptoms. Many diseases associated with potential biological agents initially present with flu-like symptoms.

4.2. Gathering Intelligence

Intelligence is a crucial component of law enforcements' efforts to combat terrorism and the collection, analysis, and dissemination on terrorist threats is among the highest priorities. Local jurisdictions absolutely need access to the information necessary to protect the public and themselves, even when that information is classified.

The Department of Homeland Security, through the Directorate of Information Analysis and Infrastructure Protection (IAIP), will merge under one roof the capability to identify and assess current and future threats to the homeland, map those threats against our vulnerabilities, issue timely warnings and take preventive and protective action. The Directorate will fuse and analyze information from multiple sources pertaining to terrorist threats, such as the National Security Agency, the Central Intelligence Agency, and the FBI. The Department of Homeland Security will coordinate and, as appropriate, consolidate the federal government's lines of communication with State and local public safety agencies and with the private sector, creating a coherent and efficient system for conveying actionable intelligence and other threat information. The IAIP Directorate will also administer the Homeland Security Advisory System.¹⁶

4.2.1 Federal. Although the collection of intelligence information can come from many sources, the FBI remains the principle agency that monitors the activities of terrorist groups within the United States. The FBI's ability to collect information – whether through physical surveillance, electronic surveillance, or human source development – represents one of its greatest weapons in the war on terror. The following are key initiatives undertaken to improve FBI intelligence and analytical capacities in the wake of the September 11 attacks.¹⁷



The Office of Intelligence is the centerpiece of the FBI's efforts to upgrade its analytical and intelligence capabilities so that it can prevent acts of terror. This office works to create professional development opportunities for analysts and ensure that quality analytical products and intelligence are shared both inside and outside the FBI. Since the events of September 11, the FBI has quadrupled the number of strategic analysts at Headquarters specifically focused on international terrorism.

Counterterrorism Watch (CT Watch) is the FBI's 24-hour global command center for terrorism prevention operations. Staffed by highly trained and experienced personnel and using sophisticated technology, it is the focal point within the FBI for gathering and managing all domestic and international terrorism threats. Incoming threats are given an initial review by CT Watch staff; those deemed credible are passed on to FBI investigators for urgent action.

¹⁶ Department of Homeland Security, DHS Organization, Information Analysis and Infrastructure Protection, www.dhs.gov

¹⁷ Federal Bureau of Investigation, *War on Terrorism, Counterterrorism*

Intelligence-Law Enforcement Coordination. The PATRIOT Act and a Federal court decision in November 2002 have broken down what has been known as “the wall” that legally separated law enforcement and intelligence functions. As a result, coordination and information sharing between the law enforcement community and intelligence agencies have been greatly improved.

As the lead law enforcement agency for investigating acts of domestic and international terrorism, the FBI relies on a vast array of partnerships across the nation and around the world to disrupt and defeat terrorists. These relationships have been steadily enhanced through a series of groundbreaking initiatives since September 11.¹⁷

Joint Terrorism Task Forces (JTTFs). JTTFs are teams of State and local law enforcement officers, FBI Agents, and other Federal agents and personnel who work shoulder-to-shoulder to investigate and prevent acts of terrorism. These task forces are important “force multipliers” in the war on terror, pooling multi-agency expertise and ensuring the timely collection and sharing of intelligence absolutely critical to prevention efforts.

National Joint Terrorism Task Force (National JTTF). The National JTTF was created in 2002 at the FBI command center in Washington, D.C. Nearly 30 agencies are represented, spanning the fields of intelligence, public safety, and Federal, State, and local law enforcement. The National JTTF collects terrorism information and intelligence and funnels it to the JTTFs, various terrorism units within the FBI, and partner agencies.

Office of Law Enforcement Coordination. This office, formed in December 2001 was established to improve the longstanding relationships with State, municipal, county, and tribal law enforcement on a national level. Recognizing that State and local police officers outnumber FBI Agents 60 to 1, the FBI is committed to folding its law enforcement partners into the war on terror by sharing information more fully and coordinating more closely. This office serves as a cornerstone of that effort, helping the FBI open channels of communication and be more responsive to the needs of law enforcement at the State and local levels.

- 4.2.2 Local.** To enhance the intelligence effort, local law enforcement agencies should actively encourage health officials to make early notifications to police, regarding any suspicious public health events or medical cases, rather than waiting for the results of a comprehensive investigation or definitive diagnosis. In addition, communities might consider designating a law enforcement liaison to public health investigations to monitor and assess suspicious health events. The findings of an epidemiological investigation may be very helpful to focus and prioritize the subsequent criminal investigation. If this approach is adopted, law enforcement investigators must be sure to avoid hindering the public health investigation process, as such efforts are an equally important part of the incident response. Law enforcement investigators should also become familiar with local

patient confidentiality statutes, as they may dictate the level of access to particular types of patient information.

4.3. Biological Incident Threat Assessment

Effective threat assessment is an on-going process that must continue through all phases of preparedness and response. Threat and risk assessments are grounded in a relatively new approach to thinking about and dealing with security issues called risk management. Risk management is the deliberate process of understanding “risk” (...the likelihood that a threat will harm an asset with some severity of consequences, ...and deciding on and implementing actions to reduce vulnerability). Risk management principles acknowledge that, (1) while risk generally cannot be eliminated, it can be reduced by enhancing protection from validated and credible threats and (2) although many threats are possible, some are more likely to occur than others. Threat and risk assessment *is a deliberate, analytical approach that results in a prioritized list of risks that can be used to select countermeasures to create a certain level of protection or preparedness* (i.e. threat-asset vulnerability combinations). Generally, because threats are dynamic and countermeasures may become outdated, it is a sound practice to periodically reassess threat and risk.

The critical first step in a sound threat assessment process is the threat analysis. The analysis should identify and evaluate each threat in terms of capability and intent to attack an asset, the likelihood of a successful attack, and its consequences. To perform a realistic threat assessment, a multidisciplinary team of experts would require valid threat data from intelligence, law enforcement and public health communities. Available threat data is often general, without clarification, and can be difficult to use. However, a multidisciplinary team of experts can use the information to develop threat scenarios, then validate and adjust the scenarios with respect to their plausibility and likeliness. The result of the threat assessment process can be used to define preparedness requirements and focus response efforts.

In addition to the very deliberate threat assessment process associated with preparedness activities, a biological incident will require a rapid threat assessment process to be conducted immediately upon recognition to evaluate the validity, extent, and seriousness of a particular threat. This process must be a joint effort from the onset. Ideally, local communities should have a pre-established, multidisciplinary, incident assessment team. The team should consist of a small group of experts and executive decision makers, as follows:

- Local Law Enforcement
- Public Health
- Emergency Management
- FBI field office
- Community’s Senior Elected Officials

At a minimum, the incident assessment process should include consultation with the FBI’s WMD Operations Unit, and the local and State health departments. Although immediate notification is mandated under PDD-39, these agencies may have essential information and intelligence that others do not have. To facilitate this process, the FBI maintains specially

trained local office WMD Coordinators that will provide rapid threat assessments, coordinate federal response and participate in the Unified Incident Command. Immediately upon notification of a potential incident, the local WMD Coordinator will contact the WMD Operations Unit at FBI Headquarters in Washington, D.C. The WMD Operations Unit will contact other Federal agencies to assemble a team that will provide expert technical and diagnostic support. Assessment resources include:¹⁸

- Centers for Disease Control and Prevention (CDC)
- U.S. Army Medical Research Institute for Infectious Disease (USAMRIID)
- Food and Drug Administration (FDA)
- Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA)

Emergency managers must keep in mind that incident assessment is a continuous process, beginning prior to and continuing throughout the response. Considerable effort must be placed on establishing effective communication networks (interoperability) and gathering and analyzing information throughout an incident.

¹⁸ Federal Bureau of Investigation, *Chemical/Biological Incident Contingency Plan*

Personal protection is critical to minimizing the risk of exposure. All responders, including law enforcement must exercise good judgment and effective protection measures to continue to operate and avoid becoming additional victims.

5.1. Medical Prophylaxis

Medical prophylaxis or immunization is the only means of providing continuous protection against some biological agents. Depending on identification of the agent, medical treatment in the form of antibiotics, antitoxins, or antiviral medications should be administered to at-risk persons by an appropriate medical authority. Vaccines against a number of potential agents are available and are most effective when administered prior to an exposure. Law enforcement planners can expect that following a large incident, a portion of the law enforcement force and their families will be among the victims. Law enforcement agencies should coordinate with local medical facilities and the local public health agency (who will coordinate with the Centers for Disease Control and Prevention (CDC)) to determine if medical prophylaxis medications are available. The Department of Homeland Security and the Department of Health and Human Services jointly manage the Strategic National Stockpile of critical prophylaxis and treatment medications to augment local health care resources during times of disaster. Finally, emergency planners should seek to establish priority for law enforcement to receive such medications to ensure an effective police force is sustained throughout an incident.^{19,20}

5.2. Isolation Precautions^{8,21}

The management of victims following a suspected or confirmed bioterrorism event must be well organized and handled. Law enforcement officers must take necessary precautions to prevent exposure or transfer of disease. Information in this section relates to interaction between law enforcement officers and victims/patients with a known or suspected exposure or illness relating to bioterrorism. Law enforcement officers investigating a crime scene where a potential biological agent has been or is suspected to have been released should follow the personal protective equipment procedures outlined in section 5.3 below.

Illnesses caused by biological events are generally not transmitted from person to person and re-aerosolization of these agents is unlikely, however, victims should be managed in a manner that minimizes direct contact. All victims, including symptomatic patients with suspected or confirmed bioterrorism-related illnesses, should be managed utilizing Standard Precautions. Standard Precautions are designed to reduce transmission from both recognized and unrecognized sources of infection and are recommended regardless of the victims' diagnosis or

¹⁹ U.S. Department of Health and Human Services, *Health and Medical Services Support Plan for the Federal Response to Acts of Chemical and Biological Terrorism*

²⁰ U.S. Department of Health and Human Services, CDC Strategic Planning Group, *Morbidity and Mortality Weekly Report*

²¹ CDC Bioterrorism Working Group, *Bioterrorism Readiness Plan: A Template for Healthcare Facilities*

presumed infection status. In the case of certain diseases or syndromes (e.g. small pox and pneumonic plague), additional precautions may be needed to reduce the likelihood for transmission (see below).

Standard Precautions prevent direct contact with body fluids (including blood), secretions, excretions, nonintact skin (including rashes), and mucous membranes. Law enforcement should be routinely using Standard Precautions when investigating traffic accidents with injury or crimes where they may come into contact with blood or other body fluids. The following Standard Precautions are taken from the Bioterrorism Readiness Plan: A Template for Healthcare Facilities, CDC, and are modified slightly for law enforcement.

- Handwashing. Hands are washed with plain or antimicrobial-containing soaps after touching blood, body fluids, excretions, secretions, or items contaminated with such body fluids, whether or not gloves are worn. Hands are washed immediately after gloves are removed, between contact with other victims/patients, and as appropriate to avoid transfer of microorganisms to other victims/patients and the environment.
- Gloves. Clean, non-sterile gloves are worn when touching blood, body fluids, excretions, secretions, or items contaminated with such body fluids. Clean gloves are put on just before touching mucous membranes and nonintact skin. Gloves are changed between tasks. Hands are washed promptly after removing gloves and before leaving a contaminated area.
- Masks/Eye Protection or Face Shields. A mask and eye protection (or face shield) are worn to protect mucous membranes of the eyes, nose, and mouth while performing tasks that may cause splashes of blood, body fluids, excretions, or secretions.
- Gowns. A gown is worn to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, excretions, or secretions. Selection of gowns and gown materials should be suitable for the task and amount of body fluid likely to be encountered. Soiled gowns are removed promptly and hands are washed to avoid transfer of microorganisms to other victims/patients and environments.

Additional precautions for handling victims associated with a suspected or confirmed infection with Pneumatic Plague or Smallpox.

Pneumatic Plague. Droplet Precautions should be used in addition to Standard Precautions.

- Droplet Precautions are used for victims known or suspected to be infected with microorganisms transmitted by large particle droplets, generally larger than 5 microns in size, that can be generated by the infected victims during coughing, sneezing, talking, or during respiratory-care procedures.
- Droplet Precautions require law enforcement officers to wear a surgical-type mask when within 3 feet of the infected victim. Based on local policy, some healthcare facilities require a mask be worn to enter the room of a patient on Droplet Precautions.

Smallpox. For victims with suspected or confirmed smallpox, both Airborne and Contact Precautions should be used in addition to Standard Precautions.

- Airborne Precautions are used for victims known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei (small particle residue, 5 microns or smaller in size) of evaporated droplets containing microorganisms that can remain suspended in air and can be widely dispersed by air currents.
- Airborne Precautions require law enforcement officers to wear respiratory protection when entering the victim's room. (Appropriate respiratory protection is based on facility selection; police must meet the minimal NIOSH standard for particulate respirators, N95)
- Contact Precautions are used for patients known or suspected to be infected or colonized with epidemiologically important organisms that can be transmitted by direct contact with the patient or indirect contact with potentially contaminated surfaces in the victims' immediate area.
- Contact Precautions require law enforcement officers to:
 - Wear clean gloves upon entry into a victims' room.
 - Wear gown for all victim contact and all contact with the victims' environment. Gown must be removed before leaving the victims' room.
 - Wash hands using an antimicrobial agent.

5.3. Personal Protective Equipment

Personal protective equipment is any clothing or apparel (such as, gloves, respirator and overalls) that will minimize an officer's risk of exposure. PPE should always be worn if there is a possibility officers could become contaminated with hazardous material. Officers should be aware however, that PPE is also the one protective measure that hinders law enforcement operations the most. Use of PPE limits an officer's visibility (especially peripheral vision), communications ability, and dexterity. Fortunately, in a biological incident, sophisticated PPE is only essential for law enforcement officers that are conducting tactical or evidence collection operations. Law enforcement agencies should attempt to procure funding to purchase and maintain the necessary protective clothing and equipment, from the various Federal assistance programs that provide funding to local law enforcement agencies. Law enforcement planners should also recognize that using PPE requires specialized training in its use. Officers must be aware that the equipment does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition.^{8,21}

The Centers for Disease Control and Prevention (CDC) and the National Institute for Occupational Safety and Health (NIOSH) published interim recommendations for emergency responder use of PPE against biological agents. These recommendations are as follows:²²

When using respiratory protection, the type of respirator is selected on the basis of the hazard and its airborne concentration. For a biological agent, the air concentration of infectious particles will depend upon the method used to release the agent. Current data suggest that the self-contained breathing apparatus (SCBA) which first responders currently use for entry into

²² CDC and NIOSH, *Interim Recommendations for the Selection and Use of Protective Clothing and Respirators Against Biological Agents*

potentially hazardous atmospheres will provide responders with respiratory protection against biological exposures associated with a suspected act of biological terrorism.

Protective clothing, including gloves and booties, also may be required for the response to a suspected act of biological terrorism. Protective clothing may be needed to prevent skin exposures and/or contamination of other clothing. The type of protective clothing needed will depend upon the type of agent, concentration, and route of exposure.

The interim recommendations for personal protective equipment, including respiratory protection and protective clothing, are based upon the anticipated level of exposure risk associated with different response situations, as follows:

- Responders should use a NIOSH-approved, pressure-demand SCBA in conjunction with a Level A protective suit in responding to a suspected biological incident where any of the following information is unknown or the event is uncontrolled:
 - The type(s) of airborne agent(s);
 - The dissemination method;
 - If dissemination via an aerosol-generating device is still occurring or it has stopped but there is no information on the duration of dissemination, or what the exposure concentration might be.
- Responders may use a Level B protective suit with an exposed or enclosed NIOSH-approved pressure-demand SCBA if the situation can be defined in which:
 - The suspected biological aerosol is no longer being generated;
 - Other conditions may present a splash hazard.
- Responders may use a full facepiece respirator with a P100 filter or powered air-purifying respirator (PAPR) with high efficiency particulate air (HEPA) filters when it can be determined that:
 - An aerosol-generating device was not used to create high airborne concentration,
 - Dissemination was by a letter or package that can be easily bagged.

5.4. Decontamination

Decontamination is the disinfection or sterilization of infected articles that makes them suitable for use. Decontamination removes and/or neutralizes biological agents on contaminated surfaces and plays an important role in controlling the spread of the disease. Items can be decontaminated by mechanical, chemical and physical methods.⁴

5.4.1 Mechanical decontamination involves measures to remove but not necessarily neutralize an agent. An example of this is rinsing an item with water or using a brush to remove agent.

5.4.2 Chemical decontamination renders biological agents harmless by the use of disinfectants. Examples of this method is careful washing with soap or bleach solutions. Careful

washing with soap and water removes most biological contamination from a surface, including skin and hair, and is often sufficient to avert contact infection.

To ensure complete decontamination of contaminated buildings or rooms, they should be decontaminated with disinfectant gases or liquids in aerosol form (i.e. para-formaldehyde or ozone). These methods are not appropriate for decontaminating people.

5.4.3 Physical decontamination renders biological agents harmless through physical means, such as heat (i.e. autoclave) and radiation (i.e. sunlight). These methods are only suitable for decontaminating durable equipment items.

By the time victims become ill as a result of a biological incident, it is unlikely that decontamination of exposed individuals or property will be necessary. With the exception of spore forming anthrax, natural processes of drying and exposure to sunlight will effectively destroy biological agents. However, decontamination will remain critical in scenarios that involve an announced attack or any operations in environments that may possess residual hazard. Most communities have access to specialized hazardous material (HAZMAT) response teams. These personnel are specifically trained and equipped to manage accidents involving toxic materials and dangerous goods. HAZMAT units are also proficient at providing decontamination support and should be incorporated into any law enforcement operation that may require decontamination activities.

5.5. Training

The most important aspect of personal safety is training. It is imperative that law enforcement personnel are properly trained and equipped for dealing with biological incidents. Awareness training will give law enforcement the best chance to survive and operate effectively in this environment. By definition, biological agents are considered to be hazardous materials. The Occupational Safety and Health Administration (OSHA) requirements for HAZMAT emergency response can be found in 29 CFR 1910.120 (q). The training requirements identified in these regulations are task specific. It is recommended that all law enforcement personnel receive an appropriate level of HAZMAT training based on the functions they may be required to perform in response to a biological incident.

The Department of Transportation (DOT), under the Hazardous Materials Transportation Act (HMTA), has published a document, titled the “*Guidelines for Public Sector Hazardous Materials Responders*,” that identifies the required training recommended for each type of emergency responder. In addition to traditional HAZMAT training, specialized WMD response training is also recommended. This training is available through a variety of sources including, the Department of Defense, various Federal and State Academies, commercial vendors, and colleges and universities. Recommended minimum training for law enforcement is referenced in the Performance Objectives Matrix (Appendix C).

Proposed Response to a Credible Threat

6

6.1. Role of Law Enforcement

The role of law enforcement responding to a credible threat includes the following:²³

Making proper notifications

- Assessing the situation
- Removing people from harm's way
- Establishing a crime scene and scene security
- Stabilizing the incident
- Determining the credibility of the threat
- Searching for additional hazards (be cognizant of secondary devices)
- Initiating the criminal investigation and gathering information
- Securing evidence

6.2. Initial Actions

Recommended strategy for responding to a telephonic or letter threat (with no other indication of agent release).⁷

- Responders should approach this incident as a routine law enforcement investigation, similar to a bomb threat. Be aware of any persons or vehicles leaving the scene.
- Protective equipment, decontamination and/or prophylaxis treatment might not be required unless additional hazards or risks are indicated.
- Law enforcement response should include local police and local FBI to perform an on-scene assessment.
- Notify the local Health Department and other necessary agencies in accordance with standard operating procedures. The incident may require a health investigation.
- Identify persons potentially at risk of exposure; they should be evacuated and evaluated by medical/public health professionals.
- Treat as a crime scene (identify, establish, protect, and secure).
- Perform information gathering at the scene.
- Perform threat assessment to determine the credibility of the threat.

²³ National Domestic Preparedness Office, *On-scene Commander's Guide for Responding to Biological/Chemical Threats*

- Have bomb squad evaluate the letter to ensure no dispersal mechanism/device inside.
- Double bag the letter and place it in a suitable evidence container (i.e. an evidence paint can).
- Establish a proper “chain of custody” and maintain appropriate documentation. Follow the FBI plan for laboratory analysis as directed by the local FBI field office.
- Perform a search to confirm no indication of agent or additional letter or device is present. Attention should be focused on appliances or devices foreign to the surroundings.
- Assess the building ventilation system to rule out forced entry or tampering.
- Consider whether full HAZMAT response is needed unless a device or suspicious material is present or individuals are symptomatic.

Proposed Response to a Suspect Material/Package/Device^{23, 24, 25}

7

7.1. Role of Law Enforcement

The role of law enforcement for responding to a suspect material/package/device include the following:

- Making proper notifications
- Assessing the situation
- Removing people from harm's way
- Being cognizant of secondary devices
- Securing the perimeter, setting up operations areas, and establishing hazard control zones (i.e. Hot, Warm, and Cold Zones)
- Assisting with control and identification of the agents involved
- Facilitating the rescue, decontamination, triage, treatment and transport of victims
- Stabilizing the incident
- Avoiding contamination
- Establishing a crime scene and scene security
- Initiating the criminal investigation and gathering information
- Securing evidence

7.2. Initial Assessment

When a suspect material, device or package is reported law enforcement officers must collect information in order to perform an initial assessment of the credibility of the threat law enforcement officers should assess the hazard by:

- Gathering information from the reporting party, bystanders, witnesses and any other first responders.
- Determining who has physically had contact with the package.
- Conducting an initial evaluation of the package; consider using binoculars while standing a safe distance away from the suspicious package.

The following questions are designed to help law enforcement officers gather key information regarding a package or device that may contain biological material.

- Individual reporting the item
 - Obtain the name, date of birth, address, and telephone number of individual.

²⁴ Paul Maniscalco & Hank Christen, *Terrorism Response Field Guide for Law Enforcement*

²⁵ International Association of Fire Chiefs, *Model Procedures for Responding to a Package with Suspicion of a Biological Threat*

- Is there a suspect package or envelope?
- Is the suspect package at a residence or business? If it is a business, obtain the business name, address, and type of business.
- What is the occupation/employment of the individual? What are the individual's duties?
- Has the individual received threats by mail or telephone before? If yes, get details.
- Why does the individual think that he/she would be targeted?
- Envelope/Package:
 - Who or what is listed as the addressee on the envelope/package?
 - Who or what is listed as the return address on the envelope/package? Is the victim familiar with the sender?
 - Is the envelope/label typewritten or handwritten?
 - Does the envelope/package have a postmark? Where?
 - Does the envelope/package have a stamp? What kind of stamp? How many? Is there a meter strip?
 - What kind of envelope/package (business, personal, etc.)?
 - How was the envelope/package sealed (tape, adhesive, etc.)?
 - Are there any additional markings on the exterior of the envelope/package?
 - Are there any stains on the exterior of the envelope/package? Describe.
- Note/Letter:
 - Obtain summary of content of letter.
 - Is there an overt threat contained within the letter? Provide exact wording.
 - Are there any stains visible on the letter?
- Foreign Material Within the Envelope/Package:
 - Describe the material found within the envelope/package.
 - Solid material:
 - * What is the color of the material?
 - * Describe granule size and shape (e.g. similar to sugar or powder).
 - * Does the material have an obvious odor? Do not purposely inhale the product.
 - * Did the material appear to become airborne upon opening?
 - Liquid:
 - * Describe the container size, type, and material (e.g. glass or plastic).
 - * What is the color of the liquid?
 - * Describe any odor. Do not purposely inhale the product.
 - * Is the liquid transparent or opaque?
 - * Is the liquid leaking from the container?
- Exposure:
 - When was the envelope/package received (date and time)?
 - What was the mode of delivery (USPS, FedEx, etc.)?

- Where is the envelope/package or letter currently located?
- What areas of the body were exposed to the material?
- Was there a spill? If so, how large?
- How many others had contact with the envelope/package or product?
- Health:
 - Is the victim experiencing any physical symptoms? What are the symptoms?
 - How long after exposure did the symptoms occur?
 - Has the victim already seen a doctor? If yes, obtain the name and contact information for doctor.
- Notifications:
 - Has the victim notified the local police?
 - Has the victim notified the fire department?
 - Has the victim notified the hazardous material teams?
 - Has the victim notified any other authority?

7.3. Initial Actions

Recommended strategy for responding to a suspect material/package/device that indicates a release of biological agent.

- Responders should approach this incident as a public safety response, similar to a HAZMAT/crime scene. Priority must be to save lives and preserve health above all other activities.
- Appropriate protective equipment, decontamination and/or prophylaxis treatment measures must be considered for all victims and responders.
- Treat as a HAZMAT/crime scene (identify, establish, protect, and secure).
- Establish Hot, Warm, and Cold Zones. The size of the hazard control zones should be based on the assessed threat. Depending on the scenario, the initial Hot Zone may range from the desktop in an office to an entire building depending on the situation.
- Shut down the building ventilation system if there has been a substance release.
- If the situation involves suspect mail in a mail processing facility, turn off any high-speed mail processing equipment that may have handled the suspicious package.
- Law enforcement response should include local police, local/regional bomb squad, local evidence collection team, and the local FBI to perform an on-scene assessment. (The FBI may assume control of the evidence collection process).

- Notify the local Health Department and other necessary agencies in accordance with standard operating procedures. The incident may require a health investigation.
- Identify and isolate persons who have been exposed or who were potentially exposed. These persons should be rapidly evacuated, decontaminated, and evaluated by medical/public health professionals. Do not evacuate the building unless an immediate threat is evident.
- Perform a threat assessment to determine the credibility of the threat and potential hazards. This may be done in conjunction with the FBI WMD coordinator, the FBI Counter-Terrorism Division's Weapons of Mass Destruction Operations Unit, the FBI Laboratory Division, Hazardous Materials Response Unit (HMRU) and appropriate Federal agencies.
- Establish perimeter security denying entry into the crime scene.
- Take steps to preserve evidence. Ensure that samples collected are separated into separate quantities for field screening and laboratory analysis. Do not consume all suspect material during field screening.
- Follow local protocols for evaluating risk regarding potential explosive device(s). An explosive hazard takes precedence over other hazards.
- If an explosive device is not ruled out, coordinate local efforts with the local/regional bomb squad and the local FBI office.
- If an explosive device is ruled out, evaluate for potential radiological, then chemical, then biological materials.
- If a radioactive source material appears to be present, follow local plans for requesting additional technical support. (i.e. Department of Energy Nuclear Emergency Search Team - NEST)
- If radioactive material is ruled out, sample the material for laboratory analysis. Positive identification of the suspect material is necessary to determine appropriate treatment measures for exposed individuals. Law enforcement should facilitate the transport and processing of these samples if required.
- Follow Evidence Response Team (ERT) protocols for documenting the crime scene. Ensure a proper "chain of custody" is maintained, as all samples are considered evidence.
- Determine what individuals require decontamination. Decontamination should only be necessary for individuals who came in direct physical contact/inhalation with the alleged biological material.
- Remove and double-bag exposed individuals' clothes and/or provide on-site shower.

- Individuals not directly exposed can be directed to remove clothing at home, where they can be laundered unless directed by law enforcement to be bagged for evidence purposes.
- Coordinate threat assessment with the local health officer. The local health officer needs the information to decide whether or not to transport exposed individuals to a medical facility for immediate medical evaluation.

Post-Decontamination considerations:

- Perform information gathering at the scene. Law enforcement should interview all potential victims and document their names and contact information.
- Perform a search to confirm no indications of an additional device(s) are present. Attention should be focused on appliances or items foreign to the surroundings.
- Decisions to provide treatment for biological agents should be made by public health officials.
- Consider the mental health needs of the victims and responders involved in the incident.
- Ensure that the results of the samples tested are relayed to the victims and responders as soon as they are available.
- If all explosive, radiological, chemical, and biological hazards are ruled out, the response should continue as a routine law enforcement investigation.

Homeland Security Presidential Directive (HSPD) 5 states, “The Secretary of Homeland Security is the principal Federal official for domestic incident management.” In the case of a law enforcement response, the Attorney General retains the lead and the Secretary of Homeland Security will facilitate required actions, consistent with their respective authorities.”²⁶

PDD-39 designates the Department of Justice (DOJ) as the overall Lead Federal Agency (LFA) for threats or acts of terrorism that take place within the United States until the Attorney General transfers the overall LFA role to the Department of Homeland Security. In accordance with the Federal Response Plan, pending further revision of the National Response Plan, DOJ delegates the overall LFA role to the FBI.²⁷

The FBI derives its fundamental legal jurisdiction to deter, investigate, direct, organize, and prepare for a WMD incident from an assortment of Federal statutes and executive branch directives. Some of these include the following:

- Title 18, USC, 1365 - Tampering with Consumer Products
- Title 18, USC, Section 871-879 - Extortion and Threats
- Title 18, USC, Sections 371-373 - Conspiracy
- Title 18, USC, Sections 175-178 - Biological Weapons Anti-Terrorism Act
- Title 18, USC, Section 2332 (a) - Weapons of Mass Destruction

Pursuant to its jurisdictional responsibility, the FBI will respond to all WMD incidents by marshalling specialized FBI and other Federal resources to support the Special Agent in-Charge (SAC) when faced with a potential WMD incident. Recent legislation has made the use, attempt to use, or conspiracy to use a weapon of mass destruction a Federal offense.

In 1990, the Biological Weapons Anti-Terrorism Act was signed into law. This statute makes it illegal to manufacture or possess biological agents for use as a weapon or to assist a foreign government in development of such a weapon. It also contains extraterritorial provisions, as well as the ability to seize and destroy biological weapons material.

PDD-39 also acknowledges that local law enforcement agencies will be the initial responders to WMD incidents. The investigation on a biological terrorism incident will be complex. To be successful, the incident investigation will require extensive coordination, cooperation, and communication amongst agencies from all levels of government (local, State, and Federal). Local law enforcement can expect to do some, all, or any part of the incident investigation; therefore, communities must be prepared (via careful planning, coordination, and training) to play an active role.

²⁶ U.S. Department of Homeland Security, *Initial National Response Plan, Sept 2003*

²⁷ Federal Emergency Management Agency, *Federal Response Plan, Interim 2003*

8.1. Evidence Collection

Identification and collection of physical evidence is undoubtedly one of the most important factors of an investigation, however, such actions should never take precedence over the incident health and safety response efforts. Although the FBI will maintain primary jurisdiction over a biological incident crime scene, local law enforcement may be tasked with supporting and facilitating the efforts to obtain environmental samples and transporting them to appropriate laboratories for analyses. In a biological incident, a critical part of the initial health and safety response will include the identification of the disease-causing agent. Responders must carry out a timely collection of initial diagnostic samples while being careful not to destroy potential evidence.

The high level of technical training required for gathering legally defensible evidence and the need for timely diagnostic and evidence collection necessitates that evidence collection personnel are trained and equipped to operate in a contaminated environment. To establish this capability, it is recommended that local forensic technicians familiarize themselves with environmental crime scene and “sick-building syndrome” investigation procedures. Technicians will quickly discover that many routine aspects of evidence collection will be significantly impacted by the use of personal protective equipment.

When approaching a suspected biological crime scene, investigators should continue to initiate standard crime scene procedures. These activities include:²⁸

- Isolating and securing the scene
- Conducting an initial walk-thru and prioritizing evidence collection activities
- Documenting and photographing the scene
- Collecting, preserving, inventorying, packaging, and transporting the evidence
- Performing a final survey of the scene

Focusing the investigation on the recovery of physical evidence material such as the attack delivery system, sample evidence, or bio-manufacturing material is key.

8.1.1 Delivery System. Recovery of the dissemination device used to carry out the attack should be handled as hazardous material and include analysis for agent residue. Evidence teams must exercise appropriate protection measures and packaging procedures when handling these items.

8.1.2 Environmental Samples. Residual agent can be exploited for detection and identification purposes and may be the best opportunity for identifying the agent prior to victims becoming ill. Unfortunately, locating sources of residual agent may be next to impossible and agent analysis is also technologically demanding. The FBI maintains specially trained and equipped Evidence Response Teams (ERT) and a Hazardous

²⁸ National Institute of Justice, Technical Working Group on Crime Scene Investigation, *Crime Scene Investigation: A Guide for Law Enforcement*

Material Response Unit (HMRU) to provide on-scene coordination of the evidence collection effort.

Unlike some chemical agents, biological aerosols disseminated outdoors by line source do not leave an agent residue (anthrax spores can be an exception near the line of release). On the other hand, aerosols generated by point source are more apt to produce residual evidence, but only in the immediate vicinity of dissemination.⁷ Aerosolized biological agents released inside a building or subway tunnel will ultimately settle out of the air, depositing on surfaces, such as carpet and other flooring, furniture, wall coverings, and window ledges.

One of the most likely sources of trace evidence, following an aerosol agent attack, is the heating ventilation air conditioning systems (HVAC) used by an affected facility. If an indoor release is suspected, the HVAC and air duct systems should be shut down to prevent spread of the agent. These systems are also likely to contain the source of the release. Evidence teams should put specific emphasis on the following HVAC components: filters and supply registers, cooling towers, condensation pan, and humidification units.

8.1.3 Other Considerations. Protective suits, biohazard bags, and laboratory equipment (i.e. incubators, fermenters, or containers with biological labels) may also be significant sources of trace evidence, and should be handled appropriately. Locations where evidence of associated biological terrorism materials has been identified may possibly require tactical personnel to secure it while investigators gather evidence. Law enforcement agencies should also be prepared to accompany non-law enforcement personnel into contamination areas to collect evidence samples and establish the necessary chain of custody. Packaging and labeling of contaminated material such as the dissemination device and environmental samples should be in accordance with standard Department of Transportation (DOT) procedures. However, ultimately all evidence collection must be conducted in accordance with established protocols of the FBI and in accordance with the diagnostic laboratory that will process the evidence. Finally, responders should not initiate site remediation activities until the crime scene investigation has been completed.

8.1.4 Clinical Evidence. As soon as a major disease outbreak or biological attack is suspected, public health officials will likely contact medical facilities to standardize a process for collection, preservation, and testing of incident-related clinical samples. If it is determined that such samples are potential evidence, criminal investigators should coordinate with the public health officials and the Medical Examiner to make sure appropriate measures are taken to obtain the clinical laboratory test results.⁸ Medical examiners should already have established protocols that support this activity (i.e. toxicology reports), however clinicians may have patient confidentiality concerns when providing such information. Policy makers should consider establishing procedures with the medical community to obtain clinical sample test results similar to existing “Rape Kit” protocols.

8.2. Laboratory Support

Investigators must follow local, State, and Federal statutes for the collection of evidence to ensure admissibility. Law enforcement planners should work with the FBI and public health officials to predetermine an appropriate diagnostic laboratory to process BW incident related environmental samples. CDC, in collaboration with the Association of Public Health Laboratories and the Federal Bureau of Investigation (FBI), established the Laboratory Response Network (LRN) to develop Federal, State, and local public health laboratory capacity to respond to bioterrorism events. Law enforcement officers should prioritize, or triage, evidence samples to reduce the volume of samples forwarded for laboratory analysis. Only those samples with a relatively high threat level should be forwarded for further testing. According to the CDC, during the anthrax incidents [2001], laboratories within the LRN tested more than 120,000 samples, the bulk of which were environmental samples.²⁹ It was the volume of these environmental samples, rather than the volume of clinical samples, that overwhelmed the laboratories. Among the environmental samples, there were white powder samples that arrived without any assessment by law enforcement as to the level of threat they posed. Officials should all consult with legal authorities to determine laws regarding collection and handling of such evidence. Evidence collection personnel should familiarize themselves with the designated laboratory identification and packaging procedures for the laboratory being used.

8.3. Witness Interviews

Information obtained from witnesses can corroborate other evidence (i.e. physical evidence and accounts provided by other witnesses) in the investigation. Therefore, it is important that this information be accurately documented, as well as witnesses' names and contact information. In situations involving large numbers of witness interviews, investigators may wish to consider taking a Polaroid® picture and thumb print of each interviewee to verify identities. Initially, investigators should question witnesses regarding the presence of unusual circumstances, items, people, or vehicles. Witnesses may have unknowingly observed the attack in progress, observing individuals wearing PPE, unusual spraying/mist, or they may have discovered an appropriate delivery system.

Investigators should actively solicit information from potential witnesses. This may include conducting interviews of all suspected victims. It is recommended that investigators work with medical providers and public health investigators to prioritize patient interviews, interviewing the sickest patients first. The ECBC *Criminal and Epidemiological Investigation Handbook* (www.ecbc.army.mil/hld) further outlines the joint law enforcement and public health investigative process. Victims may also be a source of physical evidence. Individuals exposed near the source of dissemination may have articles of clothing with suspicious residue from which an infectious agent is subsequently identified. Investigators should collect any articles suspected of being contaminated as evidence, seal them in a biohazard container or bag, and label the container appropriately. Finally, investigators should always be aware that the perpetrators of the incident might be among the victims.

²⁹ U.S. General Accounting Office, *Bioterrorism. Public Health Response to Anthrax Incidents of 2001*

The apprehension of criminal subjects will be a priority in any terrorist event. In a biological incident, the role of local law enforcement may include performing high-risk search and arrest operations of well-armed individuals who may possess biological agents. The difficulties associated with suspect apprehension is compounded by the additional hazards associated with the agent and the protective measures that must be taken to ensure officer safety. Such operations will require specialized tactical units to function in cumbersome protective clothing. Law enforcement personnel, who are physically fit, outfitted with protective clothing, armed with specialized weapons, and properly trained in dealing with hazardous materials and biological agents, will greatly assist in overall incident resolution.

9.1. Task Force Approach

Undoubtedly, tactical operations associated with a biological incident will require the integration of multiple agencies to support the tactical team. The primary jurisdiction in the event of a biological incident falls to the Special Agent in Charge (SAC) of the local FBI field office. All organizations participating in the task force will take directions from the SAC. Suggested participants for a tactical operations task force include:

- SWAT Unit
- Unified Command and Control Element
- EOD Support
- Evidence Response Team
- HAZMAT/Decontamination Support
- Medical Support Team
- Perimeter Security

In addition, several Federal support agencies including, the FBI Hazardous Material Response Unit, ATF, and the U.S. Army Technical Escort Unit can also be expected to arrive in support of this type of operation. Establishing an effective direction and control system will be crucial to the success of these operations, and will necessitate careful interagency planning, coordination, and cooperation.¹⁸ Command structures must be clearly defined and should be consistent with the Incident Command System (ICS).

9.2. Operational Considerations

The following operational considerations should be considered when conducting tactical operations that involve potential biological hazards.

9.2.1 Setting Priorities. Mission priorities should include protecting responders as well as the public. The presence of a bomb or an armed suspect presents an immediate threat to tactical personnel. Tactical commanders should consider the priority of effort when planning these operations. The following approach is recommended:

- 1) Neutralize the armed suspects
- 2) Neutralize the explosive threat
- 3) Neutralize the agent threat

9.2.2 Agent Release. After protection of the officers performing the apprehension, the paramount concern is release of the agent into the environment and surrounding community. Tactical planners should consider measures to mitigate the chance for unintentional agent release. HVAC systems within a building should be shut off to reduce the spread of agent throughout a building and into the surrounding area. Additional safeguards can be taken by shutting windows and doors to rooms as the tactical team clears them. HAZMAT units have procedures for estimating potential downwind hazard areas. These projections can be helpful for planning and developing evacuation contingencies.

The identification of hazard zones should be made prior to commencement of operations; however, physical marking of the zones may not be possible for security reasons. Once the target has been secured, hazard zones should be marked until hazard assessment teams determine the exact extent of any contamination.

9.2.3 Specialized Equipment. Specialized equipment such as PPE or the need to eliminate use of standard equipment may be necessary to function in a contaminated environment. Using personal protective equipment requires hazard awareness and training on the part of the user. Officers must be aware that the equipment does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition. PPE can also be particularly hindering to tactical operations, and thus, consideration must be given as to how the use of such equipment will impact the mission. Some considerations include:



- A. Visibility** - Most commercial protective suits (i.e. level A, B, and C) are bright colored. This clearly eliminates the advantage of the dark tactical suits. The one exception to this is the charcoal impregnated/lined protective suits (i.e. Saratoga® Hammer, Chemical Protective Undergarments, etc.).
- B. Stealth** - Most commercial suits are also made of materials that are fairly noisy when worn. Additionally, the blowers on powered air-purifying respirators (PAPRs) are noisy. Both of these clearly eliminate the ability of officers to move undetected through a location.
- C. Dexterity** - Suits, boots and gloves all affect the ability of the wearer to feel their environment and equipment. Protective equipment for tactical officers should be tested and used by team members in a variety of training missions before choosing what final equipment to adapt.

- D. Vision** - Use of a respirator limits an officer's vision (especially peripheral vision). Respirators come in a variety of styles. Officers should select a style that provides the best field of vision and allows for the use of shoulder-fired weapons.
- E. Communication** - Wearing any respirator seriously degrades the ability to communicate not only with other team members but also the suspects. Voice amplification devices are available for use with most respirators. Without such systems, hand and arm signals may be required to communicate.
- F. Compatibility** - The PPE selected for tactical operations must be compatible with the officers' tactical equipment. Wearing a respirator may hinder the use of some shoulder-fired weapons and low-light (night vision) devices. Suits must also be able to withstand the mission of the team and not be torn/ripped by the equipment worn over them.

9.3. Decontamination Support

Decontamination is essential for all personnel and equipment operating in the hazard area. Tactical operations should include personnel decontamination support by Fire or HAZMAT units. Integration with these agencies will require close coordination. Specific considerations must be addressed, such as, the decontamination and security of the tactical team's specialized equipment and weapons, and procedures for decontamination of suspects. Other decontamination considerations include:

- Building or area (site remediation)
- Evidence (containers and labels must be able to survive decontamination)
- Personal effects

9.4. Medical Support

An emergency medical team and a public health official should be on scene for immediate consult regarding any possible agent located, team member exposure, and release of agent that may occur as a result of the operation. It is recommended that tactical medics assigned to SWAT teams be trained to coordinate this support. Pre- and post-incident medical screening should be conducted for all personnel. Post-incident screening should include screening apprehended suspect(s). Planners may consider conducting a baseline blood draw on all task force personnel for follow-on medical surveillance.

9.5. Perimeter Security

The initial task in the execution of tactical operations is isolating the operational area. Once the area is isolated, time is on the side of law enforcement. Tactical commanders should take appropriate measures to ensure the task force is provided an adequately sized operational area to conduct the mission and ensure public safety. Although personnel assigned to provide perimeter

security would generally be operating in areas considered safe from exposure, these personnel should possess appropriate equipment to provide immediate respiratory protection, if needed.

9.6. Training and Exercises

Task force members must conduct individual and team training to develop and maintain technical proficiency. It is recommended that SWAT members be cross-trained to operate in a HAZMAT environment. Tactical exercises involving PPE should also be practiced as part of the teams training. Recommended training for tactical personnel should include:

- Orientation to biological agents and toxins
- Orientation to PPE, with specific emphasis on how the protective equipment affects traditional operations
- Individual and team communications while wearing PPE (both hand signals and electronic communication devices)
- Decontamination procedures (integrated with fire and HAZMAT support)
- Arrest and control methods (including handcuffing) while wearing PPE
- Team movement in PPE.
- Firearms manipulation and qualification in PPE
- Multi-agency drills requiring tactical personnel (in PPE) to assist non-law enforcement entities with evacuation, victim decontamination operations, and recovery of evidence within contaminated areas

9.7. Rehearsals

Rehearsals are key multipliers in the success of any tactical operation. Given the additional constraints (i.e. PPE → limited visibility, reduced communications) of a biological situation their importance significantly increases. Conduct of suspect apprehension should only commence after all tactical team members and support teams are prepared, briefed, and rehearsed. Rehearsals should be conducted in a similar location (building type, floor plan etc.) from the actual location. They should be conducted in the full protective gear that will be worn in the actual mission to enhance the associated drawbacks of operating in PPE. Complete operations through decontamination should be practiced so all team members and the support teams are fully aware of their mission and requirements.

Incident-control activities will become a law enforcement responsibility out of necessity. Emergency managers fearing the outbreak of widespread civil unrest will likely call upon law enforcement organizations to institute strict public control measures. Experts suggest that law enforcement will make best use of their resources by focusing their control efforts on facilitating the response rather than attempting to institute martial rule. History generally supports this conclusion, as victims of large disasters and terrorist acts have tended to act altruistic, offering assistance to response efforts, and generally behave rationally.³⁰ Whatever the case, law enforcement organizations cannot assume compliance or unrest; they must be prepared to deal with such possibilities as:

- Spread of rumors and misinformation
- Social tension
- Mass flight
- Civil disturbance
- Mass isolation

The sheer magnitude and urgency associated with a large-scale biological incident will also necessitate special tactics and coordination of an enormous amount of resources. Strategies for control of the affected area and population are organized into two elements: Public Information/Notification, and Physical Control Measures. Together, these two elements help maintain order, instruct the population, and facilitate an organized emergency response.

10.1. Public Notification/Information

Law enforcement agencies may be called upon to assist with warning the public and disseminating emergency information to isolated populations and motorists. Public information and rumor control are vital for informing the population in ways that enhance crucial activities of the response to prevent panic and maintain public cooperation. The public will have a genuine need for incident information. Citizens will require accurate, factual information to enhance their chance of effectively responding at the individual and family level. Without a clear and honest dialogue with the public, potential victims will have unrealistic expectations and will be more prone to taking actions that hinder the response. Fortunately there are several mechanisms available to rapidly disseminate information to the public.

10.1.1 Media. A biological incident will generate intense media interest. As a result, the media will be both a help and a hindrance. From the onset, the media should be considered an essential participant in disseminating official information and updates, as well as an information source for the criminal investigation (i.e. photos and video). When handled properly, the media can be a valuable asset to law enforcement by:³¹

³⁰ H. Fisher III, *Behavioral Response to Chemical and Biological Terrorism*

³¹ Federal Emergency Management Agency, *Emergency Information Field Guide*

- Helping to instill confidence in the community that all levels of government are working together to care for victims and apprehend the perpetrators
- Helping promote a positive understanding of the incident response, disaster mitigation, and public control activities
- Helping disseminate timely and accurate information and instructions to the public as well as to other responders
- Helping manage expectations and rumor control so victims have a clear understanding of all response and recovery services available to them

10.1.2 Emergency Alert System (EAS). The EAS is an automated system that replaced the old Emergency Broadcast System (EBS). EAS is technologically more advanced, faster, and more dependable. EAS is a digital system that has the following capabilities:

- Accesses television and cable stations
- Accesses radio and weather radio stations
- Has provisions for hearing and visually impaired
- Can provide multilingual alert messages
- Can target specific geographic areas
- Can interface with computers
- Can be activated and updated from multiple locations (EOCs, JICs, remotely)

10.1.3 Reverse 911. Law enforcement efforts may have the need to provide specific notification or instruction to households in a specific community. Reverse 911 is an automated system that delivers a prerecorded message via the telephone to all homes in a designated geographical area. This system can be used to provide information such as, where to go for medical care, what route to use, whether to evacuate, or what to do if they have information regarding the attack.

10.1.4 Hotlines/Helplines. Toll-free phone numbers can be established and operated to provide help instructions, gather investigation tips, or summon home-based victim assistance. Establishing special incident hotlines/helplines and promoting their use should help reduce 911 call volume, allowing the 911 system to continue to function.

10.1.5 Neighborhood Canvas. The most thorough and by far the most time consuming and resource intensive method for disseminating information is the neighborhood canvas. This technique involves teams of officers going door-to-door within a designated area, providing instruction and information packets (i.e. self-help fact sheets). The advantage of this method is it allows decision makers continuous feedback regarding numbers of sick, specific community needs, incident-related rumors, and insight to the cause and magnitude of the incident.

10.1.6 Other. The magnitude of the incident may require law enforcement to consider innovative means of communications to inform the public. (i.e. Internet Web sites,

aircraft banners, police patrol public address systems, and billboards). Whatever the mode of communication used, information must be presented in a clear and trustworthy manner.

10.2. Physical Control Measures

As mentioned earlier, physical control efforts should be geared toward facilitating the response. Emergency responders must be provided a controlled environment in which to operate to function effectively. High priority control measures include: providing security at medical facilities and mass transit centers, maintaining traffic ingress and egress routes, and conducting high visibility patrols.²

10.2.1 Provide Security at Vital Installations. Unimpeded government operations are essential to maintaining control. Public transportation, communication, and other public services and utilities must continue. Disruption of such services will further increase public anxiety and the possibility of civil unrest or violence. Law enforcement must take proactive measures to ensure that vital installations such as the following are protected:

- Large transportation nodes
- Community medical centers
- Alternate care facilities
- Pharmacies
- Medical distribution sites
- Government facilities
- Mobilization centers
- Mortuary facilities

During a biological incident, victims will converge on medical facilities in overwhelming numbers. Medical facilities, in cooperation with law enforcement agencies, should make provision to queue their patrons in zig-zag lines, around buildings, and on sidewalks. In this way, patrons can claim a particular space, feel less anxious about their ability to enter in an orderly fashion and can better judge the length of time it will take them to enter, as they progress in a line. Using a queue also prevents the potential hazard of a mob rushing the entry point to the facility. This sense of urgency or anxiety is the crucial factor that must be removed to minimize the potential for crowd disorders outside of a facility.

10.2.2 Provide Traffic Control of Ingress and Egress Routes. Following a biological incident, panic may cause some individuals to flee from the area of attack, even when there is no longer any danger of exposure. Uncontrolled mass flight will make it almost impossible to bring critical response personnel and materials to an affected community. Planners must recognize that a biological incident may require large numbers of personnel and equipment to maintain unrestricted access in and out of the affected community. Law enforcement may be tasked to clear corridors (traffic lanes) for the ingress and egress of emergency equipment and escort fire, EMS, and response units to and through affected areas. Predetermined traffic control points should be established to

assist with directing civilian traffic and response vehicles. Non-essential traffic should be detoured around the affected area and alternate routes provided. Vehicles, cones, flares, barriers, and signs can be used to restrict access and direct arriving emergency personnel to staging areas. Traffic routing information should be included in the official public information bulletins.

10.2.3 Patrol the Affected Area. Patrols may be needed to maintain control. Patrols provide a visual presence reducing the likelihood of panic and civil unrest. Patrols also allow law enforcement a flexible means to react to civil disturbance incidents.

10.2.4 Passes. Experience has proven that there are instances where special passes are needed in a disaster area to control access to those with legitimate reasons for being in the area. Only under extraordinary circumstances should passes be required after a biological incident. The decision to require passes will rest with the local policy makers and direction for use of passes should be coordinated through the EOC. Law enforcement personnel may issue passes or direct those seeking admittance to an access control center (i.e. police department, or staging area) to obtain them. Common sense and discretion must be used in issuing/not issuing passes, as over enforcement can severely hamper relief efforts as much as under enforcement.

The following vehicles and their occupants may be exempt from pass requirements: Marked utility company vehicles, military, city/county/State government vehicles, and relief organizations (i.e. Red Cross, Salvation Army) vehicles. However, consideration must be given to the intelligence information that has been gathered in recent years pertaining to terrorist plans to obtain emergency response and public official vehicles and uniforms. Many emergency passes are already in existence (i.e. press cards and medical personnel identification) and should be honored unless a reasonable question arises as to their authenticity. If such questions arise, individuals should be directed to an access control center for consideration of a temporary pass.

10.2.5 Use of Force. Use of force must always be “objectively reasonable” under the circumstances and consistent with the law. At the outset, peace officers should be acquainted with the law as it relates to the lawful detention of subjects for “quarantine” as directed by local health officials. Most states only address the authority for peace officers to lawfully detain persons in situations involving unusual or suspicious activity relating to criminal activity, and not based solely on a public safety or health threat. Such public safety law is usually reserved for the local Director of Health Services. It is recommended that if current State/local law does not authorize law enforcement officers to detain persons for public health or safety reasons involving biological terrorism, then obvious legislative amendments should be sought. As to force, it is recommended that every effort be used to avoid a physical altercation. Reality dictates that force may be necessary to control uncooperative individuals.

10.3. Control of Response Assets

With significant influx of aid expected, resource managers should plan to provide measures for controlling the arrival and implementation of response assets. Law enforcement should be prepared to support such control activities as:

10.3.1 Points of Arrival. These are locations (typically an airport, train station, or bus station) within or near the disaster area, where newly arriving response personnel, supplies, and equipment are directed. Law enforcement can expect to assist with meeting and escorting arriving assets from the points of arrival to their initial destinations, such as mobilization centers, and staging areas.

10.3.2 Mobilization Centers. A mobilization center is a designated location for receiving and processing assets prior to their movement to an appropriate staging area. Law enforcement may be required to assist with activities such as credentialing personnel and security.

10.3.3 Staging Areas. At staging areas personnel, equipment, and supplies are assembled for immediate deployment to an operational site. Once again, law enforcement personnel may be needed to provide security and escort assets to their operational site.

The ultimate success of the response will depend on the effectiveness of the medical system. Hospitals will be inundated following a large biological incident. Officials will be forced to make life and death decisions based on limited information, regarding the appropriate utilization of response resources. A well-orchestrated community outreach network could be initiated to ease the burden on medical facilities and gather incident information. In the case of an attack that produces catastrophic numbers of casualties in a large metropolitan area, officials may instruct law enforcement to coordinate a door-to-door survey of the community. The initial purpose of this effort would be to assess the situation and gain a better understanding of the scope and magnitude of the event. Later, as disaster medical response resources are made available, the outreach would be used to help identify and coordinate assistance and care for individuals that are unable to seek out medical aid on their own. A community outreach effort might also be used to distribute incident information and medications. Although this response strategy is manpower intensive, it can be particularly useful to prevent a person-to-person spread of disease. In situations that involve disease that is considered contagious, it would generally be best to isolate individuals from one another and avoid mass gatherings. In such a scenario, authorities might instruct citizens to stay at home and receive assistance via the community outreach.²

11.1. Concept Overview

Law enforcement, first responder, and community health resources can be integrated to provide an active community outreach network. This process relies on the rapid mobilization of manpower from a number of pre-existing organizations combined with a unified public information campaign. Specific operational objectives for this effort may include the following:

- Identify operational boundaries of the affected area (what jurisdictions require disaster aid)
- Actively search out and identify the sick, focusing on identification of the severely ill or those unable to seek out medical care on their own
- Contact all potentially affected persons within a 24-period
- Provide interactive control of the affected population
- Lessen the community's feeling of isolation and helplessness by mobilizing volunteers and giving them an opportunity to participate in the response effort

³² U.S. Army Soldier and Biological Chemical Command, Improved Response Program, *Criminal and Epidemiological Investigation Handbook*, U.S. Army Soldier Biological and Chemical Command, 2003 Edition.

11.2. Role of Law Enforcement

The community outreach will need to be mobilized rapidly, therefore, law enforcement may be assigned the initial lead in the outreach effort, until a more appropriate lead for sustained outreach operations can be designated. The lead agency will be required to oversee critical activities such as:

- Soliciting mutual aid and volunteer support resources
- Developing a strategy to conduct a comprehensive neighborhood canvas
- Standardizing the processes for information collection and dissemination
- Establishing and maintaining communication networks and information flow
- Organizing and instructing survey teams
- Assigning geographical areas of responsibility

11.3. Resources

11.3.1 Community Police Officers. Police officers work in a regular sector and have established relationships with the community. They know their local area residents, and the residents know the officers. These personnel should be used to manage and direct the survey teams.

11.3.2 Community Organizations. Social groups and church organizations will be able to identify residents, assist law enforcement in locating victims/casualties, assist with language barriers/ religious beliefs/ local customs. These citizens can augment survey teams or assist with coordinating homebound care.

11.3.3 Uniform Services/Utilities. Solicit help from the members of U.S. Postal Service (USPS), public works personnel, sanitation workers, and newspaper delivery service. They can provide information about mail buildup or papers on lawns, no answers during meter readings or no garbage left for pickup. Any of these can be indications that someone is not at home or unable to call for assistance.

11.3.4 Neighborhood Watch Programs. In many communities this is an existing crime prevention program. In the case of a BW incident, these civilians can assist police by monitoring the neighborhood and its residents. They can go house to house and assist the outreach program by checking on victims/casualties. Also, they can assist with security in their neighborhoods.

11.4. Techniques

11.4.1 Organization of Survey Teams. With the assistance of the health department and volunteer groups, police will begin organizing 8-10 man survey teams and assigning each team a specific canvas area or sector.

11.4.2 Breakdown of Effort. A large incident will likely necessitate dividing the affected area into smaller, more manageable sectors of responsibility. As needed these sectors can be

further divided and assigned to individual survey teams. The community outreach effort should be able to make good use of existing sector methods such as: police patrol areas, fire station response zones, school districts, and mail routes.

11.4.3 Survey Form. In addition to providing care, the community outreach can be an important tool for rapidly collecting incident information. As survey teams identify individuals who may have been part of the bioterrorism incident, both law enforcement and public health investigators will begin conducting interviews. Criminal investigators and public health investigators should work together to establish a information gathering tool that supports the joint needs of each investigation to include the criminal investigation and public health surveillance.

11.4.4 Marking System. To enhance the efficiency of the community outreach effort a door marking system may be used. Such a system can be useful to indicate whether a survey team has performed a recent visit and whether residents have received their information or medication. Some examples are colored door stickers, door handle hangers, and colored tape.

11.5. Personal Protective Equipment (PPE)

PPE for workers performing community outreach must be in accordance with the personal protection measures outlined in Section 5.

A biological incident has the potential to result in situations that will deplete most communities' law enforcement resources. Therefore, it is necessary that communities develop plans for coordinating and providing assistance to ensure an effective and efficient response. The following describes a mobilization strategy that might be activated to coordinate and deploy State/region-wide law enforcement response resources. The strategy is based on the *Florida Sheriffs' Association Statewide Task Force - Emergency Mobilization Plan*.

12.1. Concept Overview

To prevent an overwhelming burden on a few jurisdictions during a large-scale emergency or disaster, a State or regional law enforcement entity may organize a mutual aid system whereby an operationally feasible percentage of committed resources can be mobilized and deployed to locations where assistance is requested. Under such a system, a large geographic area such as a State or region is organized into response zones (each is typically made up of several counties). All jurisdictions participating in the mutual aid system (State or region-wide) agree to commit a percentage of their sworn personnel to be dispatched at the request of the State/regional coordinator. This percentage is based upon the magnitude and severity of the event.

At the time a large-scale emergency or disaster occurs, or is predicted, and assistance is needed or anticipated, the affected community may request assistance through a State/regional law enforcement coordinating entity. The State/regional law enforcement coordinator would have the capability and authority to conduct a State/region-wide "call-up." To execute the "call-up," the coordinator would make an initial assessment of the situation and assign an event level that dictates the percentage of committed resources by responding agencies. This "call-up" would then be issued to participating organizations of the law enforcement mutual aid network. During the event, the coordinator will continuously evaluate the situation and adjust up or down and reassign the levels, if and when changes in the magnitude of the event occur.

12.2. Event Levels

Descriptions of the recommended event levels and the corresponding percentages of emergency mobilization or "call-up" are as follows:

Level 1 - Minor Event/Emergency. Defined as an event with a potential of minimal consequence limited to usually one county or small area involving cross-jurisdictional or multi-county overlap, and an event that is unlikely to deplete the affected counties total resources, but where special equipment and/or personnel are needed.

Call-up: The State/regional coordinator issues assignments to address specific support requests. Deployed assets will generally be committed for less than one week.

Level 2 - Major Emergency/Disaster. Defined as an event with a potential of major consequence, usually involving more than one county, though only one county may be affected, but more often involving several counties. The event would likely result in the depletion of law enforcement resources in each county affected.

Call-up: The State/regional coordinator issues a State/region-wide call-up. Each jurisdiction mobilizes 5% of their available resources for up to two weeks, to support the response.

Level 3 - Catastrophic Emergency/Major Disaster. Defined as an event with a potential of catastrophic consequence, usually involving more than one county with massive destruction in the affected counties. The magnitude of the event is such that it would definitely deplete law enforcement resources in the counties affected.

Call-up: The state/regional coordinator issues a state/region-wide call-up. Each jurisdiction mobilizes 10% of their available resources for up to four weeks, to support the response.

It is important to note that the “call-up” percentages represent the total available sworn law enforcement strength committed by each jurisdiction should an event as described occur. It does not mean, however, that the total percentage committed would actually be deployed. “Call-up” only places designated assets on “stand-by” status to facilitate the response. The actual deployment of assets will be based on the specific needs of the affected community.

12.3. Response Zones

Creating response zones within the State/region provide the mutual aid coordinators flexibility and control in the response. Assets can be mobilized by zone in a time-phased manner, reducing the likeliness of over-committing resources to a particular event. Designating response zone coordinators will also help create a defined command and communication structure to assist with alert notifications and information dissemination.

History has demonstrated that the threat of biological terrorism is real. Recent events within the United States have involved the use of biological agents against individuals and/or groups of people. The threat of terrorism is constantly evolving. As intelligence and emergency response forces seek better ways to deter and respond to terrorism so do the terrorists continue to identify vulnerabilities in our preparations and ability to respond. As a result, response plans, to include national planning and guidance, continue to change.

This guide is intended as a foundation for law enforcement agencies to gain a better understanding of the threat of biological terrorism and the issues that are associated with these agencies in preparing for and responding to such events. It is meant to supplement current information provided to law enforcement agencies and thereby assist these agencies in developing their internal policies and procedures for responding to these types of incidents.

The information in this guide is current as of its publication; however, agencies are urged to continue to review changes to policies and plans as they relate to preparing for and responding to incidents involving the terrorist use of biological agents. Such new policies and plans may come from, but are not limited to, the Department of Homeland Security, Centers for Disease Control and Prevention, and the Federal Bureau of Investigation.

- Bioterrorism-Related Inhalation Anthrax: The First 10 Cases Reported in the United States*, National Terrorism Preparedness Institute, (<http://www.cdc.gov/ncidod/EID/vol7no6/jernigan.htm>).
- Bioterrorism Working Group, *Bioterrorism Readiness Plan: A Template for Healthcare Facilities*, 1999, Association for Professionals in Infection Control and Epidemiology Bioterrorism Task Force and Centers for Disease Control and Prevention.
- Bomb Data Center, *Biological Materials and Hazards*, 1998, Student Manual, Indianhead, MD, Federal Bureau of Investigation.
- Carus, S., *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the 20th Century*, Working Paper, Washington D.C., 2000, Center for Proliferation Research, National Defense University.
- Centers for Disease Control and Prevention (CDC), *Bioterrorism: An Overview Bioterrorism, Bioterrorism Preparedness and Response Program*
- CDC Strategic Planning Group, *Morbidity and Mortality Weekly Report*, Volume 49 - No. RR-4, Biological and Chemical Terrorism: Strategic Plan for Preparedness and Response, 2000, Atlanta, GA, U.S. Department of Health and Human Services.
- Chandler, David & Landigan, India, *A Journalist's Guide to Covering BioTerrorism*, 2002 Radio and Television News Director's Foundation.
- Chemical/Biological Incident Contingency Plan*, 1998, Federal Bureau of Investigation.
- Dashiell, T., W. Patrick, F. Sidell, *Chem-Bio Handbook*, 1998, Alexandria, VA, Jane's Information Group.
- Department of Health and Human Services, *Guidance for Filtration and Air-Cleaning Systems to Protect Building Environments from Airborne Chemical, Biological, or Radiological Attacks*, National Institute for Occupational Safety and Health, Publication 2003-136, 2003.
- Emergency Information Field Guide*, 1998, Federal Emergency Management Agency.
- Emergency Mobilization Plan*, 1999, Florida Sheriffs' Association Statewide Task Force.
- Evidence Detection and Preservation for Weapons of Mass Destruction*, National Terrorism Preparedness Institute, 1999, Student Manual, St. Petersburg, FL, St. Petersburg Junior College.

Federal Response Plan, 2003, Federal Emergency Management Agency.

Fischer III, H., *Behavioral Response to Chemical and Biological Terrorism*, 1998, Information Paper, Domestic Preparedness Office.

FM 8-9 NATO Handbook on the Medical Aspects of NBC Defensive Operations AmedP-6 (B) Part II - Biological, 1996, U.S. Army.

Health and Medical Services Support Plan for the Federal Response to Acts of Chemical and Biological Terrorism, 1996, Department of Health and Human Services.

Initial National Response Plan, 2003, U.S. Department of Homeland Security.

Information Analysis and Infrastructure Protection, Department of Homeland Security, DHS Organization www.dhs.gov.

Interim Recommendations for the Selection and Use of Protective Clothing and Respirators Against Biological Agents, Centers for Disease Control and Prevention & National Institute for Occupational Safety and Health, 2001.

Maniscalco, Paul and Christen Hank, *Terrorism Response Field Guide for Law Enforcement*.

Medical Management of Biological Casualties Handbook, 1996, U.S. Army Medical Research Institute of Infectious Diseases.

Model Procedures for Responding to a Package with Suspicion of a Biological Threat, 2004, International Association of Fire Chiefs.

National Domestic Preparedness Office, *On-scene Commander's Guide for Responding to Biological/Chemical Threats*, 1999, Washington D.C., National Institute of Justice Office of Science and Technology.

Office of Emergency Preparedness, *Proceedings of the Seminar on Responding to the Consequences of Chemical and Biological Terrorism*, 1995, Washington D.C., U.S. Public Health Service.

Technical Working Group on Crime Scene Investigation, *Crime Scene Investigation: A Guide for Law Enforcement*, 1999, Washington D.C., National Institute of Justice.

10-90 Gold NBC Response Plan, 1998, Defense Protective Services.

“Title XIV: Amendment to Defense Against Weapons of Mass Destruction, Subtitle A: Domestic Preparedness,” *National Defense Authorization Act of FY 97: Nunn-Lugar-Domenici Pub Law No. 104-201*, 1996. U.S. Congress.

Tucker, Jonathan B., *Historical Trends Related to Bioterrorism: An Empirical Analysis*, Monterey, California, 2000, Monterey Institute of International Studies.

U.S. Army Soldier Biological and Chemical Command, Biological Warfare Improved Response Program, *1998 Summary Report*. U.S. Army Soldier and Biological Chemical Command, Biological Warfare Improved Response Program, 1999.

U.S. Army Soldier Biological and Chemical Command, Improved Response Program, *Criminal and Epidemiological Investigation Handbook*, U.S. Army Soldier and Biological Chemical Command, 2003 Edition.

U.S. Army Soldier Biological and Chemical Command, Improved Response Program, *Community Outreach/Mass Prophylaxis Pamphlet: A Mass Casualty Care Strategy for Biological Terrorism Incidents*, U.S. Army Soldier and Biological Chemical Command, 2002.

United States General Accounting Office, *Bioterrorism. Public Health Response to Anthrax Incidents of 2001*, 2003, GAO-04-152.

War on Terrorism, Counterterrorism, Federal Bureau of Investigation
www.fbi.gov/terrorism/counterterrorism/analysis.

Appendix A

CDC List of Threat Agents

CDC List of Threat Agents

Category A

Agents in this category are considered the highest threat to national security because they

- Can be easily disseminated or transmitted person-to-person;
- Cause high mortality, with potential for major public health impact;
- Might result in public panic and social disruption; and
- Require special action for public health preparedness.

Anthrax (*Bacillus anthracis*)

Smallpox (*Variola major*)

Plague (*Yersinia pestis*)

Botulism (*Clostridium Botulinum* toxin)

Tularemia (*Francisella tularensis*)

Filoviruses;

- Ebola hemorrhagic fever
- Marburg hemorrhagic fever

Arenaviruses;

- - Lassa (Lassa Fever)
- - Junin (Argentine hemorrhagic fever)

Category B

Agents in this category are considered the second highest threat to national security because they

- Are moderately easy to disseminate;
- Cause moderately high mortality, and
- Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Q fever (*Coxiella burnetti*)

Brucellosis (*Brucella* species)

Epsilon toxin (*Clostridium perfringens*)

Staphylococcus Enterotoxin B (SEB)

Burkholderia mallei (Glanders)

Salmonella species

Shigella dysenteriae

Alphaviruses;

- Venezuelan encephalomyelitis
- Eastern and Western encephalomyelitis

Ricin toxin (*Ricinus communis*)

Escherichia coli

Vibrio cholerae

Cryptosporidium parvum

Category C

Agents in this category are considered the third highest threat to national security because they:

- Easily obtainable;
- Easily produced and disseminated, and
- Have the potential to cause high morbidity and mortality with major health impact.

Nipah virus

Hantaviruses

Tickborne hemorrhagic fever viruses

Tickborne encephalitis viruses

Yellow fever

Multidrug-resistant tuberculosis

Appendix B

Biological Agent Data Summaries

Bacterial Agents:

- **Anthrax**

- **Route of Entry:** Anthrax naturally occurs in cattle, sheep, and other hoofed animals. It is normally transmitted to man through cuts or abrasions in the arms and hands. Other routes include ingestion and inhalation.
- **Symptoms:**
 - Inhalation: The early symptoms are chills, fever, nausea, and swelling of lymph nodes. Victims begin to feel better and then get worse with major pulmonary involvement.
 - Absorption (Cutaneous): Intense itching followed by painless papular to vesicular lesions which become black edematous scabs.
 - Ingestion: Abdominal pain, nausea, vomiting, severe diarrhea, GI bleeding and fever.
- **Incubation Period:**
 - Inhalation: The incubation period is one to six days up to six weeks.
 - Absorption: One to twelve days.
 - Ingestion: One to seven days.
- **Transmission:** Non contagious.
 - Inhalation: In spore form, it can be transmitted to man through the respiratory tract, where it is a much greater threat, the mortality rate can reach 80-90 percent.
 - Absorption: Direct contact with skin lesions.
 - Ingestion: None.
- **Etiology:** Anthrax bacteria can form spores that make the organism more resilient.
- **Treatment:** Treatment involves the use of antibiotics and vaccine and treating the specific symptoms. Once symptoms of the disease develop, treatment is supportive but often unsuccessful. Ciprofloxacin (500 mg q 12h) or Doxycycline (100mg q 12h) and additional antibiotics.

- **Plague**

- **Route of Entry:** Plague is normally transmitted to humans from either the bite of an infected flea or by inhaling the organism. It can also be aerosolized and be transmitted to man through the respiratory tract causing pneumonic plague. There are three forms of plague; bubonic, pneumonic and septicemic plague.
 - Bubonic/Septicemic: The most common type in nature is transmitted from rats to man from the bite of an infected flea. The bites are usually on the lower extremities.
 - Pneumonic: Inhalation/aerosol.
- **Symptoms:** Early symptoms are high fever, chills, headache, spitting up blood and shortness of breath.
 - Bubonic: “Run down” feeling, high fever, staggering gait, delirium, mental confusion, shock, coma, and tender lymph nodes (buboes).

- Pneumonic: High fever, chills, headache, bloody sputum, chest pains, nausea and vomiting, abnormal lung sounds, rapidly to chest pain. Advanced: Purpuric skin lesions, copious watery or purulent sputum, and respiratory failure in one to six days. Circulatory collapse, bleeding, diathesis, and death.
 - Septicemic: Symptoms same as bubonic without buboes and spreads to central nervous system, lungs and elsewhere.
 - **Incubation Period:**
 - Bubonic/Septicemic: two to six days.
 - Pneumonic: Occurs within two to three days.
 - **Transmission:** Contagious.
 - Bubonic/Septicemic: Droplet and lesion secretions precautions.
 - Pneumonic: Droplet precautions until 48 hours of effective antibiotic therapy.
 - **Etiology:**
 - Bubonic: Occurs after skin inoculation, the bacteria are transported to regional lymph nodes and then into the blood infecting secondary organs, such as the lungs, spleen, liver, and brain.
 - Pneumonic: Aerosol inhalation of the highly contagious *Yersinia pestis* from BW agent dissemination source or from respiratory droplets from another infected patient. Almost 100% of untreated victims will die.
 - Septicemic: Is a generalized infection in the blood from the bacteria (bubonic plague) escaping through the lymph nodes or lungs. In 2.5 percent of the cases, plague septicemia may develop directly without a clinically apparent lymph infection.
 - **Treatment:** Involves using antibiotics treating specific symptoms.
 - Bubonic/Septicemic: Streptomycin, tetracycline, chloramphenicol are effective if administered early within 24 hours of onset of symptoms.
 - Pneumonic: Treatment is early administration of antibiotics within 24 hours of onset of symptoms. Streptomycin or doxycycline for 10 – 14 days is effective.
- **Cholera**
 - **Route of Entry:** Ingestion, inhalation.
 - **Symptoms:** A sudden onset of watery rice diarrhea, nausea, and vomiting. If untreated, it will lead to severe dehydration and death.
 - **Incubation Period:** One to five days.
 - **Transmission:** Non contagious. Enteric precautions and careful hand washing.
 - **Etiology:** Adhere to the intestinal mucosa causing fluid loss.
 - **Treatment:** Fluid and electrolyte replacements and antibiotics.
 - **Tularemia**
 - **Route of Entry:** Inhalation absorption, ingestion.
 - **Symptoms:** Tularemia may appear in several forms. These are ulceroglandular (skin lesion noted), glandular (fever and tender lymph

nodes), typhoidal oculoglandular (fever, weight loss and possibly pneumonia), pharyngeal (ulcers confined to the throat) and pneumonic (pneumonia).

- **Incubation Period:** Three to five days.
 - **Transmission:** Non-contagious.
 - **Etiology:** This is a zoonotic disease, that humans acquire after contact of their skin or mucous membranes with tissues or body fluids of infected animals or from tick or mosquito bites.
 - **Treatment:** Antibiotics.
- **Q fever**
 - **Route of Entry:** Inhalation and ingestion.
 - **Symptoms:** Q fever presents itself with flu-like symptoms with fever lasting up to two weeks. It eventually ends with a pneumonia illness that is incapacitating for long periods of time. Fever, cough, and pleuritic chest pain as early as 10 days after exposure. May resemble a viral illness or atypical pneumonia.
 - **Incubation Period:** 14 to 26 days.
 - **Transmission:** Non-contagious. Aerosol droplet.
 - **Etiology:** This is a zoonotic disease, which humans acquire after inhalation of infected aerosols. It causes death of host cells allowing the organism to circulate throughout the body causing flu-like symptoms throughout the body. This leads to a chronic infection usually endocarditis.
 - **Treatment:** Can resolve without antibiotics. Treatment is tetracycline or doxycycline orally for five to seven days.

Toxins

Toxins are non-living poisonous chemical compounds that are produced by living organisms such as animals, plants, and microorganisms. These agents are thousands of times more lethal than standard chemical agents, but unlike chemicals, are not typically volatile or able to cause illness through skin absorption. As a result, toxins are not prone to person-to-person transmission. The toxicity of these agents varies by their route of entry (inhalation vs. ingestion vs. subcutaneous). There are numerous naturally occurring toxins. The two categories discussed in this handbook are neurotoxins and cytotoxins. Neurotoxins, which attack the nervous system, are fairly fast acting and can act in a manner opposite to that of the nerve agents, because they prevent nerve-to-muscle stimulation. Symptoms such as mental confusion, loss of balance, vision problems, tremors, or seizures are common. Cytotoxins are cell poisons that are slower acting and can have a variety of symptoms including vomiting, diarrhea, rashes, blisters, jaundice, bleeding, or general tissue deterioration.

There are numerous other modes of action of toxins, which will not be discussed in this guideline.

- **Botulinum Toxin A**
 - **Route of Entry:** Inhalation.

- **Symptoms:** Symptoms usually begin 24-72 hours after ingestion or inhalation of the toxin; blurred vision, mydriasis (dilated pupils), diplopia (double vision), ptosis (drooping eyelids), photophobia (light sensitivity), dysphagia (difficulty swallowing), and dysphonia (difficulty speaking), weakness, dizziness, dry mouth and throat, begin to appear. A delay in symptoms may range from 6 to 7 days however, depending on the amount of toxin. After exposure to the toxin, a descending paralysis (head-to-toe) and bulbar palsies become the characteristic symptoms. A bulbar palsy is a cranial neuropathy that produces a loss of function in the nerves that originate from the brain stem. Treatment is supportive. Botulism patients frequently require prolonged ventilator support (sometimes lasting for weeks) during definitive care.
- **Incubation Period:** Two to eight days.
- **Transmission:** Non contagious.
- **Etiology:** Botulinum is a neurotoxin. It normally affects victims after the ingestion of improperly canned food. It results in a disease called botulism.
- **Treatment:** Includes antitoxin and supportive measures.
- **Ricin**
 - **Route of Entry:** Inhalation and ingestion.
 - **Symptoms:** May include nausea, vomiting, bloody diarrhea, abdominal cramps, breathing difficulty, renal failure, and circulatory collapse depending on the route of exposure. Victims can linger 10-12 days before death or recovery, depending upon the dose received. Initial symptoms usually appear 24-72 hours after exposure. Shock typically ensues with death occurring in 3 days. Ricin is 6-9 times more toxic than Sarin.
 - **Incubation Period:** Inhalation: 8 to 24 hours with respiratory failure in 36 to 72 hours (dependent on dosage). Ingestion: 24 to 72 hours.
 - **Transmission:** Non-contagious. Wear a mask to prevent inhalation.
 - **Etiology:** The toxin attaches to cell surfaces of a variety of tissues, particularly the stomach lining, if ingested, or the moist, upper respiratory tissues, if inhaled. Ricin inhibits protein synthesis and causes necrosis of the lower airway epithelium and severe pulmonary edema. If Ricin is ingested, it causes gastrointestinal hemorrhage with necrosis of the liver, spleen, and kidneys. When injected, the toxin acts to destroy local tissue areas, muscles and lymph nodes and the blood vessels in the body leading to death.
 - **Treatment:** Includes general supportive care including fluid support of the circulatory system and respiratory support. There is no antitoxin currently available.
- **Staphylococcal Enterotoxin B (SEB).**
 - **Route of Entry:** Ingestion, Inhalation.
 - **Symptoms:** Victims become severely incapacitated. Victims will present with flu-like symptoms of chills, headache, and a non-productive cough. If ingested, they will have severe nausea, vomiting and diarrhea.

- **Incubation Period:** Inhalation three to 12 hours.
- **Transmission:** Non contagious.
- **Etiology:** Stimulates production of T cells.
- **Treatment:** Supportive care, gastric lavage, charcoal, or cathartics.

Viruses

Viruses are the simplest type of microorganism and are composed of only genetic material (RNA or DNA) surrounded by a protein coat. Viruses are much smaller than bacteria and lack a system for their own metabolism, needing a host to survive. This host can be plant, animal, insect, bacteria, or human. Many viruses attack specific types of cells and use the host cell's chemical energy and protein synthesizing capabilities to replicate. The virus brings about changes in the host cells resulting in diseases including cancer and death. In some cases, the exact mechanism by which viruses produce effects is not completely understood. A few viruses can be treated with antiviral drugs, but vaccination, when available, is the most effective means of preventing infection. Certain viruses have characteristics that would make them particularly well suited for use as biological agents. These include:

- **Smallpox**

The smallpox virus causes an overt clinical disease only in humans. There are no animal reservoirs of the virus in nature. This was the major reason why the disease was selected for global eradication in 1980, and it is the only disease to date that has earned this distinction. The U.S stopped its civilian vaccination program in 1981. Despite eradication, concerns over clandestine stockpiles of smallpox still remain.

- **Route of Entry:** Inhalation and absorption.
- **Symptoms:** Malaise, fever, rigors, vomiting, headache, backache, skin lesions (maculae-papules-pustular vesicles) on face, neck, palms, soles, and extremities synchronously.
- **Incubation Period:** 7 to 17 days. Quarantine patients 16 to 17 days after exposure.
- **Transmission:** Contagious. Aerosol and skin contact.
- **Etiology:** Smallpox is essentially a disease of tissue destruction. Smallpox and Monkey pox are closely related viruses, naturally transmitted by the aerosol route, and produce clinically indistinguishable human disease. Airway exposure to the virus is followed by viral replication in the regional lymph nodes of the airways, and organism proliferation in the blood occurs 7 to 17 days later with the onset of an influenza-like syndrome with fever, rigors, vomiting, headache, and backache. Two to three days later lesions begin to appear. The virus disseminates to the spleen, liver and lungs, and an initial mild rash is followed 2 to 3 days later by an erupting rash on the face, arms, and hands. The mortality rate can reach 30%.
- **Treatment:** There is an effective vaccine; however, without this protection the aerosolized virus presents a respiratory threat. Treatment involves

supportive therapy and antibiotics (tetracycline, doxycycline, ciprofloxacin or erythromycin) for diarrhea and shedding organism.

- **Venezuelan Equine Encephalitis (VEE)**

There are eight distinct viruses, which belong to the VEE complex, that have been associated with human disease. VEE normally occurs in northern South America, Central America, Mexico, Trinidad and Florida. The virus can be killed by heat and disinfectants.

- **Route of Entry:** Inhalation and Injection.
- **Symptoms:** Malaise, spiking fevers, rigors, severe headache, photophobia, myalgia, nausea, vomiting, cough, sore throat, diarrhea.
- **Incubation Period:** One to five days.
- **Transmission:** Non-contagious. Blood and body precautions.
- **Etiology:** Causes inflammation of the meninges.
- **Treatment:** Supportive care, anticonvulsants, analgesics. Recovery in one to two weeks.

- **Viral Hemorrhagic Fevers**

The Viral Hemorrhagic Fevers (VHF) are a diverse group of illnesses caused by a variety of viruses with a wide range of morbidity and mortality. In spite of the diverse and variable forms of clinical disease, the VHFs share a common generalized clinical presentation, with the vascular bed being the target organ. VHFs include Yellow Fever, Ebola, Marburg, Lassa Fever, Rift Valley Fever and Dengue Fever.

- **Route of Entry:** Inhalation, absorption.
- **Symptoms:** Symptoms of Viral Hemorrhagic Fever are elevated temperature, easy bleeding, small skin spots caused by hemorrhaging, rash, malaise, muscle pain, headache, vomiting and diarrhea. Full-blown cases will evolve into shock and generalized mucous membrane hemorrhage with involvement of the neurological, respiratory, or pulmonary, and central nervous systems.
- **Incubation Period:** Four to 21 days.
- **Transmission:** Contagious. Strict barrier nursing practices, mask-gown-gloves, in conjunction with isolation. Contact hazard with blood and other secretions.
- **Etiology:** They are very stable viruses that are highly infectious as fine-particle aerosols. In most cases, the target organ is the vascular bed causing micro-vascular damage and changes in the vascular permeability. This causes the patients to bleed throughout the body. This condition is known as disseminated intravascular coagulation (DIC).
- **Treatment:** There are vaccines for some of these.

Type of Agent	Signs / Symptoms	Routes of Infections	Incubation/Untreated Mortality	Person-to-Person Transmission	Treatment
Bacteria					
Anthrax Inhalation	Flu-like symptoms, fever, chest pains possible 1 – 2 days improvement, rapid respiratory failure and shock. Meningitis may develop.	Inhalation, absorption, ingestion.	1 to 6 days (Up to 6 weeks) Untreated mortality: 100%	None	Antibiotics Ciprofloxacin (500 mg q 12h) or Doxycycline (100mg q 12h) and additional antibiotics.
Absorption	Intense itching followed by painless popular lesions to vesicular lesions to scabs surrounded by edema.	Method of dissemination: Aerosol.	1 to 12 days Untreated mortality: less than 5%	Direct contact with skin lesions – infection through absorption.	
Ingestion	Abdominal pain, nausea, vomiting, severe diarrhea, GI bleeding and fever.		1 to 7 days	None.	
Plague Bubonic plague	Malaise, high fever, staggering gait, delirium, mental confusion, shock, coma, and tender lymph nodes (buboes).	Transmission by vector (flea bite).	2 to 10 days Untreated mortality: 50%	Possible inhalation - secretions and lesions precautions.	Antibiotics: Streptomycin (30mg/kg/d IM in divided dose x 10 days), Doxycycline (200mg IV then 100mg q 12h x 10 days), Chloramphenicol (1g IV q 6h) Pneumonic: Fatal unless initiated within 24 hours of symptoms.
Pneumonic plague	High fever, chills, headache, hemoptysis, chest pains, nausea and vomiting, stridor, rapidly to dyspnea. Advance:P purpuric skin lesions, copious watery or purulent sputum, respiratory failure in 1 to 6 days. Death respiratory failure, circulatory collapse and bleeding diathesis.	Transmission: Inhalation /aerosol.	2 to 3 days Untreated mortality: 50 - 90%	Droplet precaution until 48 hours of effective antibiotic therapy.	
Septicemic plague	Symptoms same as bubonic without buboes and spreads to central nervous system, lungs and elsewhere.	See bubonic	See bubonic	See bubonic	
Cholera	Asymptomatic to severe with sudden onset. Vomiting, abdominal distention and pain with little or no fever followed rapidly by diarrhea. (5 to 10 liters per day)	Ingestion Covert or aerosol dissemination.	1 to 5 days Untreated mortality: 50%	Enteric precautions and careful hand-washing employed.	Fluid and electrolyte replacement. Antibiotics to shorten diarrhea.

Type of Agent	Signs / Symptoms	Routes of Infections	Incubation/Untreated Mortality	Person-to-Person Transmission	Treatment
Q Fever	Fever, cough, and pleuritic chest pain as early as 10 days after exposure. May resemble a viral illness or atypical pneumonia.	Inhalation and ingestion. Covert or aerosol dissemination.	14 to 26 days Untreated mortality: less than 1%	Aerial droplet precaution with coughing.	Can resolve without antibiotic treatment. Antibiotic to shorten duration. – tetracycline (500mg q 6h) or doxycycline (100mg q 12h).
Toxins					
Botulinum Toxin A (Botulism)	No fever, excess mucus in throat, dry mouth and throat, blurred/double vision, difficulty moving eyes, mild pupil dilation, difficulty speaking, dysphagia, dizziness, intermittent ptosis, unsteady gait, systematic descending flaccid paralysis and developing respiratory failure.	Inhalation and ingestion. Aerosol	Inhalation: 24 to 72 hours (12-80 hours). Ingestion: 12 to 72 hours (2-8 days). Mortality with respiratory assistance 5%. Progression from onset to respiratory failure in as little as 24 hr.	None	*Botulinum Antitoxin from Public Health sources. Supportive care and ventilator support.
Ricin	Weakness, fever, cough, and about 18-24 hours after aerosol exposure hypothermia, hypotension and cardiovascular collapse. Ingestion: Nausea, vomiting, bloody diarrhea, abdominal cramps, breathing difficulty, renal failure, and circulatory collapse.	Inhalation: Aerosol Ingestion: Aerosol Injection	Inhalation: 8 to 24 hours with respiratory failures in 36 to 72 hours (dependent on dosage). Ingestion: 24 to 72 hours	Mask to prevent inhalation.	No antitoxin available. Dependent on route of exposure. Inhalation: Appropriate treatment for pulmonary edema and respiratory support. Ingestion: Gastric decontamination with lavage and super-activated charcoal, followed by cathartics such as magnesium citrate. Injection: Supportive care and respiratory support.
Staphylococcal Enterotoxin B (SEB)	Fever, chills, headache, myalgia and non-productive cough, dyspnea and retrosternal chest pain. High dose: Septic shock and death. Ingestion: Above plus nausea, vomiting and diarrhea.	Inhalation: Aerosol Ingestion.	Inhalation: 3 to 12 hours Mortality: Most patients recover after one to two weeks	None	No antitoxin available. Supportive care Ingestion: gastric lavage, super-activated charcoal, cathartics

Type of Agent	Signs / Symptoms	Routes of Infections	Incubation/Untreated Mortality	Person-to-Person Transmission	Treatment
Viruses					
Smallpox	Malaise, fever, rigors vomiting, headache, backache, skin lesions (maculae-papules-pustular vesicles) on face, neck, palms soles and extremities synchronously.	Inhalation: Aerosol/airborne Absorption: Close contact with vesicles or secretions.	7 to 17 days Quarantine: 16 to 17 days after exposure.	Strict isolation, inhalation hazard in close contact. Contact with skin lesions until scab separate and fall off or secretions–	Strict isolation. Supportive care. Previous vaccination does not contain lifelong immunity.
Venezuelan Equine Encephalitis (VEE)	Malaise, spiking fevers, rigors, severe headache, photophobia, myalgia, nausea, vomiting, cough, sore throat, diarrhea.	Inhalation: Aerosol Vector: Mosquitoes	1 to 5 days Mortality rate: less than 1%	Blood and body fluids precaution.	Supportive care. Anticonvulsants, analgesics. Recovery in one to two weeks.
Viral Hemorrhagic Fevers (VHF) Yellow Fever Ebola Marburg Lassa Fever Rift Valley Fever Dengue Fever	Febrile illness: easy bleeding, petechiae, hypotension and shock, flushing of the face and chest, edema. Malaise, myalgiae, headache, vomiting, diarrhea.	Direct Contact Uncertain. Aerosol	4 to 21 days Untreated mortality 40 to 90%	Strict barrier nursing practices (mask-gown-gloves) in conjunction with isolation. Contact hazard with blood and other secretions.	Antibiotics. Supportive care.

Table B-1. Biological Quick Reference Chart

Appendix C

Performance Objectives Matrix

Performance Objectives Matrix

Performance Requirements						
Legend for requirements: ○ -basic level ● advanced level ◆ specialized						
Competency level		Awareness		Operations	Technician/ Specialist	Incident Command
		Employees	Responders			
Examples		Facility workers, hospital support personnel, janitors, security guards	Initial firefighters, police officers, 911 operators/dispatchers	Incident response teams, EMS, basic HAZMAT personnel on scene	Incident response team specialists, technicians, EMS advanced, and medical specialists	Incident Commanders
Areas of Competency	Ref.					
1. Know the potential for terrorist use of NBC weapons: - What nuclear/biological/chemical (NBC) weapons substances are. - Their hazards and risks associated with them. - Likely locations for their use. - The potential outcomes of their use by a terrorist. - Indicators of possible criminal or terrorist activity involving such agents. - Behavior of NBC agents.	C, F, M, m, G	○ ○ ○ ○	● ● ● ● ●	● ● ● ● ● ●	● ◆ ● ● ● ● ◆	● ● ● ● ● ●
2. Know the indicators, signs, and symptoms for exposure to NBC agents and identify the agents from signs and symptoms, if possible.	C, F, M, m	○	●	●	◆	●
2a. Knowledge of questions to ask caller to elicit critical information regarding an NBC incident.	G, m		● (911 only)			
2b. Recognize unusual trends which may indicate an NBC incident.	G, m		●	●	◆	●
3. Understand relevant NBC response plans and standard operating procedures (SOP) and your role in them.	C, F, M, m	○	●	●	●	●
4. Recognize and communicate the need for additional resources during an NBC incident.	C, m, G	○	●	●	●	●
5. Make proper notification and communicate the NBC hazard.	C, F, M, m	○	●	●	●	●
6. Understand: - NBC agent terms. - NBC toxicology terms.	C, F, m	○	●	● ● (EMS-8 only)	● ●	● ●
7. Individual protection at an NBC incident: - Use self-protection measures. - Properly use assigned NBC protective equipment. - Select and use proper protective equipment.	C, F, M, m	○	●	● ● ●	◆ ◆ ◆	● ● ●
8. Know protective measures and how to initiate actions to protect others and safeguard property in an NBC incident.	F, M	○	●	●	●	●
8a. Know measures of evacuation of personnel in a downwind hazard area for an NBC incident.	M, G		●	●		●

Performance Requirements						
<i>Legend for requirements:</i> ○ -basic level ● advanced level ◆ specialized						
Competency level		Awareness		Operations	Technician/ Specialist	Incident Command
		Employees	Responders			
9. CB decontamination procedures for self, victims, site/equipment, and mass casualties: - Understand and implement. - Determine.	C, F, M, m	○ self	●	● ●	◆ ◆	● ●
10. Know crime scene and evidence preservation at an NBC incident.	F, M, m	○	● (except 911)	●	●	●
10a. Know procedures and safety precautions for collecting legal evidence at an NBC incident.	F, G, m		●	●	◆	●
11. Know federal and other support infrastructure and how to access in an NBC incident.	C, F, M, m		○ (911 only)	○	●	◆
12. Understand the risks of operating in protective clothing when used at an NBC incident.	C, F, m		○	●	●	●
13. Understand emergency and first aid procedures for exposure to NBC agents and principles of triage.	F, M		○	●	◆	○
14. Know how to perform hazard and risk assessment for NBC agents.	C, F, M, m			●	◆	●
15. Understand termination/all clear procedures for an NBC incident.	C, F, m			●	●	●
16. Incident Command System/Incident Management System - Function within role in an NBC incident. - Implement for an NBC incident.	C, F, M			●	●	◆ ◆
17. Know how to perform NBC contamination control and containment operations, including for fatalities.	C, F, M, m			●	◆	●
17a. Understand procedures and equipment for safe transport of contaminated items.	G, m			●	◆	●
18. Know the classification, detection, identification, and verification of NBC materials using field survey instruments and equipment, and methods for collection of solid, liquid, and gas samples.	C, F, M, m			○	◆	●
19. Know safe patient extraction and NBC antidote administration.	F, m			● (medical only)	◆ (medical only)	○
20. Know patient assessment and emergency medical treatment in an NBC incident.	M, m, G			● (medical only)	◆ (medical only)	
21. Be familiar with NBC related public health and local EMS issues.	G			● (medical only)	● (medical only)	○

Performance Requirements						
<i>Legend for requirements:</i> ○ -basic level ● advanced level ◆ specialized						
Competency level		Awareness		Operations	Technician/ Specialist	Incident Command
		Employees	Responders			
22. Know procedures for patient transport following an NBC incident.	F, G			● (medical only)	● (medical only)	○
23. Execute NBC triage and primary care.	G			● (medical only)	◆ (medical only)	
24. Know laboratory identification and diagnosis for biological agents.	G				◆ (medical only)	
25. Have the ability to develop a site safety plan and control plan for an NBC incident.	C, F				◆	◆
26. Have ability to develop an NBC response plan and conduct exercise of response.	G, m					●

Legend for references:

C - 29 CFR 1910.120 (OSHA Hazardous Waste Operations and Emergency response)

M - Macro objectives developed by a training subgroup of the Senior Interagency Coordinating Group

m - Micro objectives developed by U.S. Army Chemical & Biological Defense Command

G - Focus Group workshop

F - NFPA Standard 472 (Professional Competence of Responders to Hazardous Materials Incidents) and/or

NFPA Standard 473 (Competencies for EMS Personnel Responding to Hazardous Materials Incidents)